NATIONAL MUSEUM OF VICTORIA

Vol. XXIII. Part 1.

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The Journal of the Department of Agriculture of Victoria, Australia.

January, 1925.

PRINCIPAL CONTENTS

Wheat and Its Cultivation

Fertilizers and the Fertilizer Industry

Maize Variety Competition

List of Fertilizers Registered for 1925

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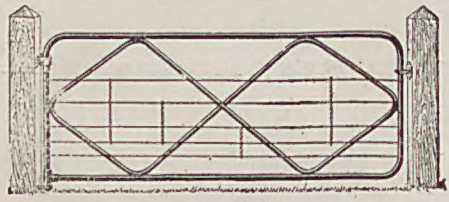

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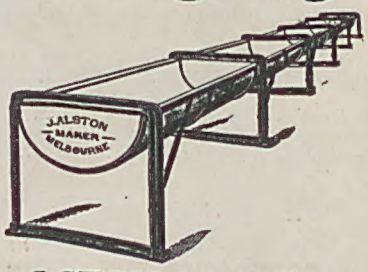

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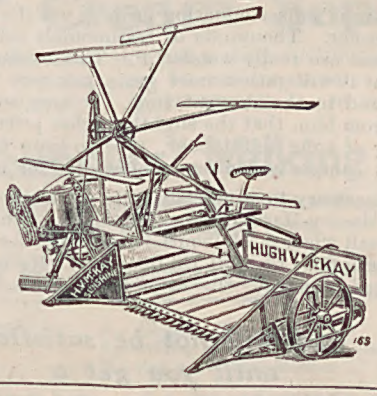

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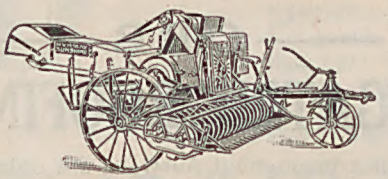

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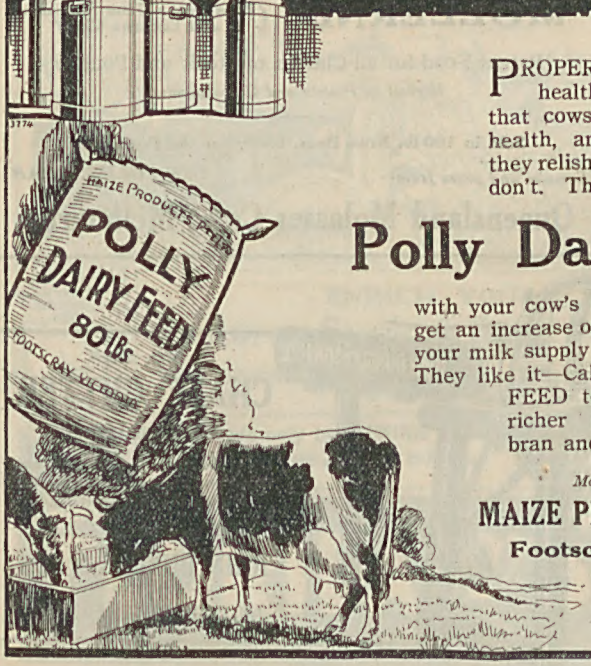

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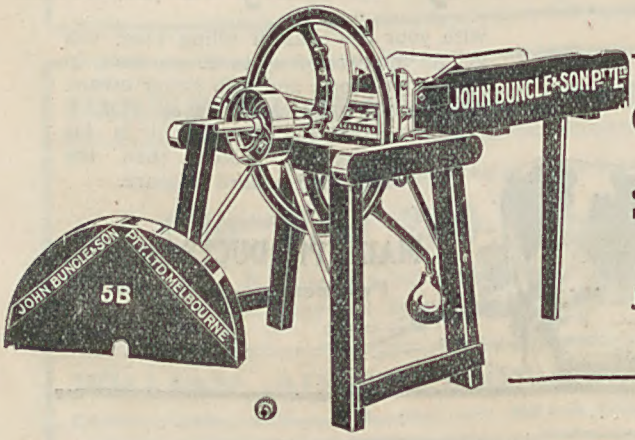

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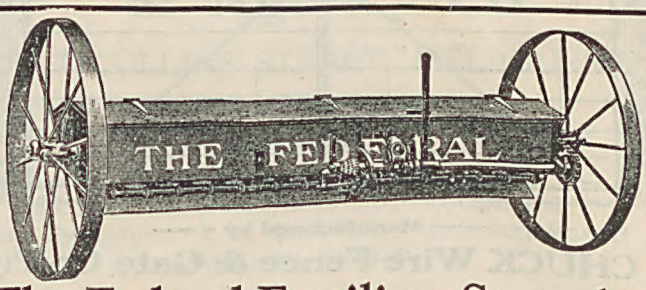

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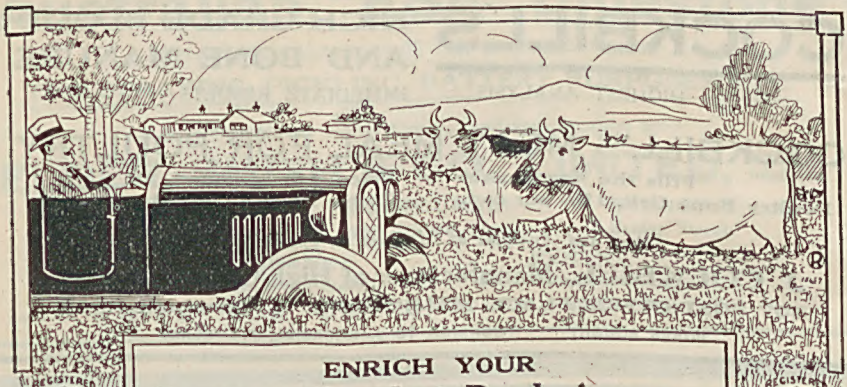

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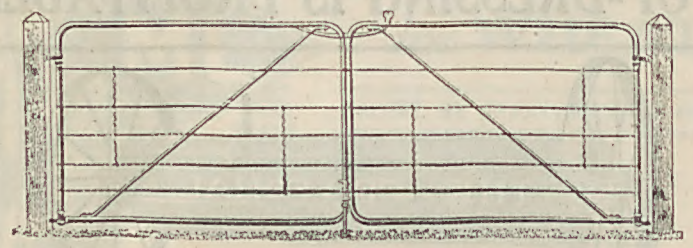

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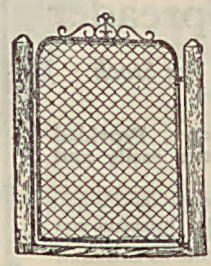

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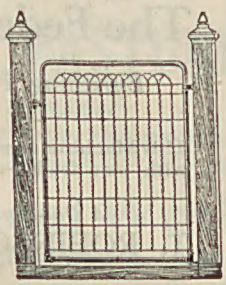

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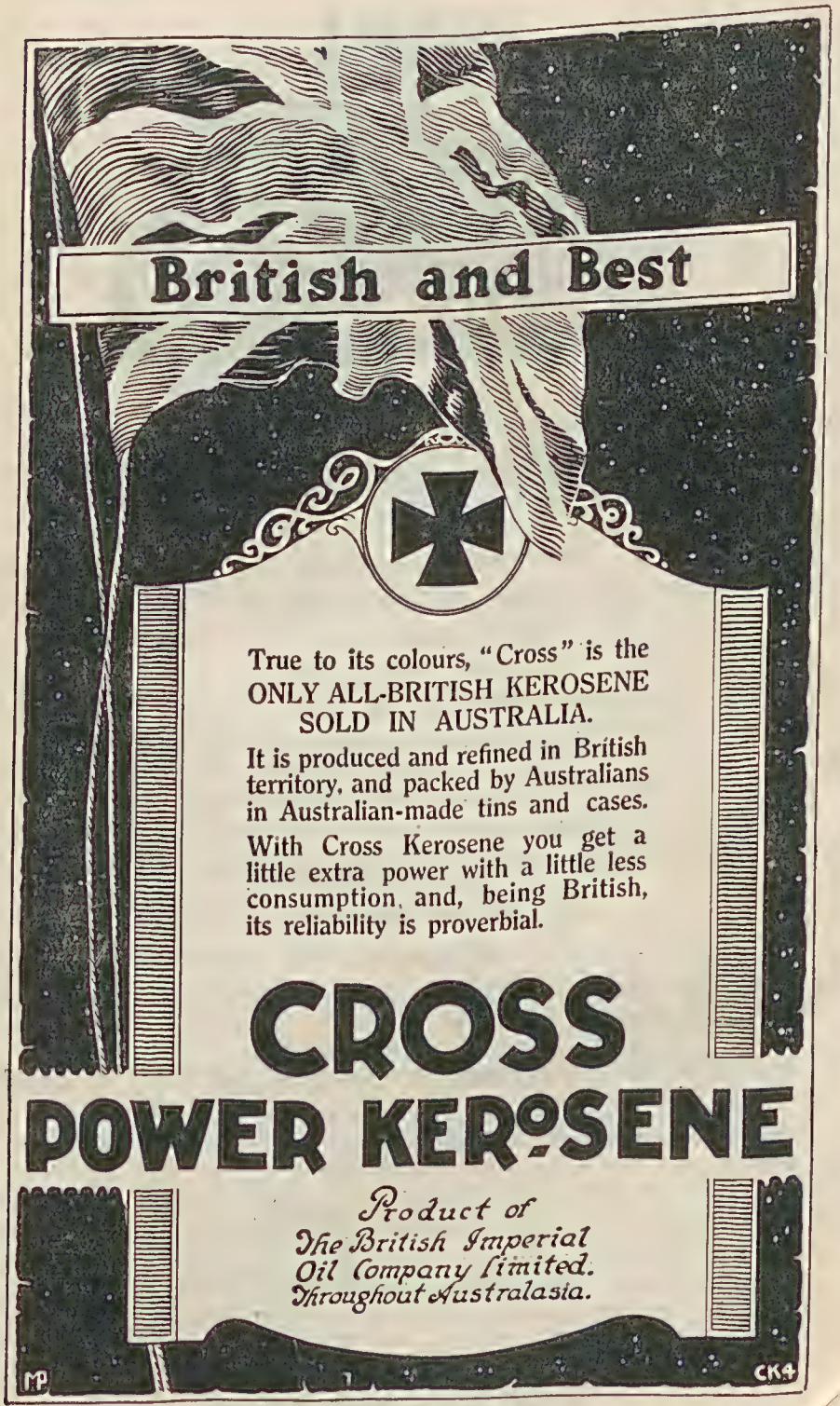
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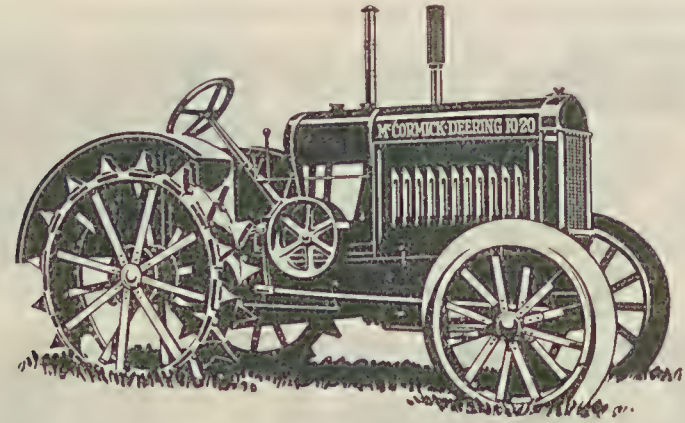

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VICTORIA.

Vol. XXIII. **January, 1925.** **Part 1.**

WHEAT AND ITS CULTIVATION.

(Continued from page 742.)

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VII.—MARKETING OF WHEAT.

Wheat is grown in Australia for the home market and the foreign market. A small portion of the crop, amounting to from 28,000,000 to 30,000,000 bushels, is consumed locally, whilst the balance is shipped principally to the United Kingdom. Small quantities of wheat and flour are shipped to South Africa and the East.

F.A.Q. Sample.

In Australia each State has hitherto sold its wheat separately on an f.a.q. (fair average quality) basis, which is a standard sample struck by the Corn Trade Section of the Chamber of Commerce each harvest. This standard sample is said to be prepared by mixing representative samples of wheat from a number of railway stations, in parts proportional to the amount produced in the districts supplying the station. The f.a.q. sample thus obtained is then used as the standard of quality for local sales, and is used as the basis of sales and arbitration on foreign markets.

The grain offered for sale by the farmer at the local railway station is compared with the standard sample fixed by the Chamber of Commerce. The agent will accept all samples equal to or above the standard at current prices, but makes a dockage on all wheat below the standard, according to the extent to which it falls short of the standard. Thus all wheat equal to or above the standard receives a uniform price.

This system of marketing on a single standard may be convenient for traders in a young country with a limited export trade, but it cannot be a permanent feature of a country with a big export surplus. Sooner or later some method of classifying the grain into grades according to quality must be adopted. With the introduction of a system of bulk handling, some such classification becomes necessary.

Bulk Handling.

Bulk handling of wheat is in operation both in the United States and in Canada, and its introduction has greatly aided rapid transportation, and the payment for grain on the basis of its grade and quality.

The elevator has immensely facilitated the handling of wheat and other grains, due to the fact that threshed grain can be handled almost like water. In America and Canada wheat is run directly from the threshing machine into tight wagon boxes holding from 50 to 100 bushels, and hauled directly to the elevator where it is automatically dumped and elevated by power machinery. Country elevators usually have a capacity of from 15,000 to 30,000 bushels, while terminals vary from 1,500,000 to 3,000,000 bushels, and are made of steel or concrete.

The value of wheat varies with its quality, and with the purpose for which it is to be used.

The principal characteristics which aid in fixing the grade are (1) weight per bushel, (2) plumpness, (3) soundness, (4) colour, (5) freedom from dust, foreign seeds and other matter, and from (6) a mixture of the different types of wheat.

These characteristics vary so in degree that they are difficult of measurement and definition. Consequently grade requirements have been couched in obscure terms, and the responsibility for their interpretation has been left largely with the grain inspectors.

Handling Wheat in America.

In the United States and in Canada all wheat of the same grade is stored in bulk in elevators without preserving the identity of individual lots, and general receipts are issued for the specified amount of grain of a certain grade lodged with the Elevator Company. These receipts can be delivered in fulfilment of contracts, and when grain is withdrawn from storage, a specified amount instead of a specified lot of a particular grade is delivered by the warehouseman.

The principal commercial grades of wheat officially recognized at Chicago and New York are as follow:—

Winter	1	White winter wheat, No. 1, 2, 3, 4
	2	Red winter wheat, No. 1, 2, 3, 4
	3	Hard winter wheat, No. 1, 2, 3, 4
	4	Spring wheat, No. 1, 2, 3, 4
	5	Durum wheat, No. 1, 2, 3, 4
Pacific	6	Pacific Coast red wheat, No. 1, 2, 3, 4
		Pacific Coast white wheat, No. 1, 2, 3, 4

In addition there is wheat of "rejected" grade or "no grade," which means wheat that was too poor, too wet, or too smutted to be placed in any grade. In general, No. 1 wheat must weigh 60 lb. or more; No. 2, 58 lb.; No. 3, 56 lb.; No. 4, 50 lb. or more.

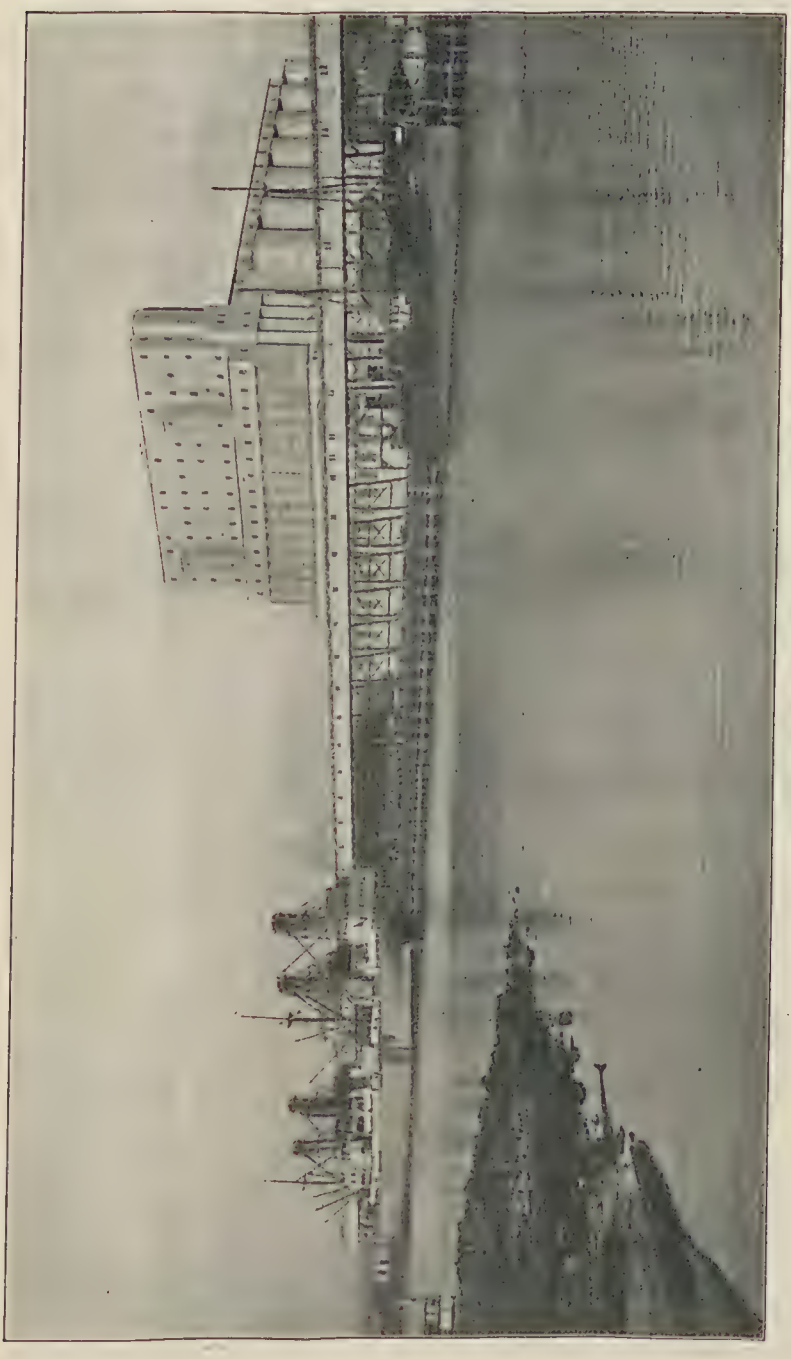


Fig. 55.—Terminal Elevator, Sydney, New South Wales.

The grain trade of Canada is governed by the Canada Grain Act. For many years Canadian farmers were dissatisfied with the treatment they received from the Elevator and the Railroad Companies. They accused the Elevator Companies of unjust weighing, faulty grading, and paying prices that were too low, and exacting charges that were too high. The dissatisfaction led to the passing of the Canada Grain Act, which includes provision for the construction of railway platforms, the operation of elevators, the distribution of railway trucks, and governs the trading between the farmers and commission men.

The farmers, however, did not merely agitate for legislation. They organized a "Grain Growers' Association," which in addition to carrying on campaigns for legislation, created an agency for selling grain. This company has now the greatest commission business in Winnipeg, the centre of the grain trade of Canada, and has purchased and built a large number of country elevators as well as two terminal elevators. Experience has shown that the wheat-growers of Canada can operate their own country elevators, and that they can build up an organization capable of handling the grain from the time it leaves the farm until it reaches the miller or exporter.

In Canada all grain received at the elevators is inspected and graded according to quality, and the farmers are paid a price per bushel according to its grade.

Wheat for milling purposes varies in value according to—

1. The amount of impurities, such as oats, barley, weed seeds, chaff, &c.

2. Its condition—whether smutty, damp or musty.

3. Its grade, i.e., its plumpness, weight per bushel, and capacity for producing high-grade flour.

The Canada Grain Act defines and determines the grades. It divides grain into five general classes—(1) "No grade," (2) "Condemned," (3) "Rejected," (4) "Commercial grade," and (5) "Statutory grade."

"No grade" means grain that through having too high a percentage of moisture is unfit for putting in the elevators.

"Condemned grain" means grain that has been heated or bin burnt, whatever grade it might otherwise be.

"Rejected grade" means musty, smutty, or sprouted grain, or grain that contains a large admixture of impurities.

"Commercial grade" means grain which, because of climatic and other conditions, cannot be included in the grades provided for in the Act.

"Statutory grades" means grain of the highest grades which are defined by Parliament, embodied in the Grain Act, and which do not vary with the crop.

There are four of these grades for Manitoba spring wheat, three for Alberta red and white winter wheat. The statutory definitions can be changed only by Parliament; they do not vary with the crop. The commercial grades, however, are fixed by the Standards Board, and may vary from year to year.

The grain is stored in the terminal elevators in accordance with the grades, and all grain of the same grade is binned together. Buying and selling is done on the basis of grade. Any mistake in the grading of grain, therefore, may involve either buyer or seller in serious losses.

The whole of the grain inspection is carried out under the supervision of a Board of Grain Commissioners, whose offices are located at the terminus at Port William.

The introduction of bulk handling in Australia will inevitably result in some system of grading grain to take the place of the present f.a.q. sample. The f.a.q. system does not encourage farmers to produce high-class wheat.

The bulk-handling system will expedite the transportation of the crop, because of the time saved in loading at the country elevators, and unloading at the terminal elevators. Bags will practically be dispensed with, though they may be used in conveying wheat from the farm to the local station. The industry, however, must bear the interest on the cost of installing the system, and pay the maintenance charges of operating the elevators. Bulk handling has been in operation for several years past in New South Wales, but only a portion of the crop has been handled through the elevators.

Wheat Pooling.

From 1915 to 1920 the Australian wheat crop was marketed by an organization created under Government supervision. The whole of the wheat crop was pooled, and each grower received the f.o.b. price, less freight, handling charges, and dockage. The Pool was controlled by the Australian Wheat Board, comprising a Minister of the Federal Cabinet, and the Ministers of Agriculture of each of the four wheat States.

The Board had control of all overseas sales, all shipping and chartering of vessels, and fixed the price at which wheat was sold for local consumption. The wheat crop of each of the four contracting States was controlled by a Wheat Commission, the personnel of which varied in the four States, and an Advisory Board comprised of representatives of the shipping agents, millers, and farmers.

The Wheat Commission controlled all local sales, paid agents to handle the crop at the country stations and the seaboard, and made advances through the banks to farmers on delivery of their wheat.

The "Pool" arose because of the shortage of freight. The war through one cause or another put out of action or diverted for war purposes nearly one-half of the world's shipping. Freight was difficult to secure at almost any price, and as the greater part of the crop would have to be stored, it was essential in the interests of the wheat-growers to have an organization with sufficient financial resources to finance the wheat crop.

That organization was the "Pool," which had the resources of the Commonwealth and State Governments at its back. Only the Government could shoulder the responsibility of handling the entire wheat crop and taking the risk of insufficient freight and a falling market.

Voluntary Pooling.

After 1920 wheat was marketed, in two ways—(1) open market, (2) voluntary "Pool." The farmer was free to sell his wheat to private merchants at London parity, or to market it through the "Pool." In Victoria statutory authoriy was given to the Victorian Wheat Corporation to take control of farmers' wheat, and sell it to best advantage locally and overseas. The Corporation made advances against all wheat delivered at the country stations. As the wheat was realized further

advances were made. Similar voluntary pooling organizations were formed in New South Wales, Western Australia, and South Australia.

The present opinion of wheat-growers is favorable to the system of marketing by co-operative organizations. Efforts are being made to create a single selling agency in London to act for all the co-operative Pools. One single selling agency should enable the wheat-grower to obtain the full world's price for his product, but even a single selling agency cannot secure more than the buyer is able and willing to give

Bulk Handling of Wheat in Australia.

New South Wales installed a bulk-handling system in 1920, after many years of insistent agitation for a bulk-handling scheme on the part of the growers. Though the scheme has been in operation since 1920-21, the actual amount of wheat handled by the silos forms a relatively small proportion of the total crop.

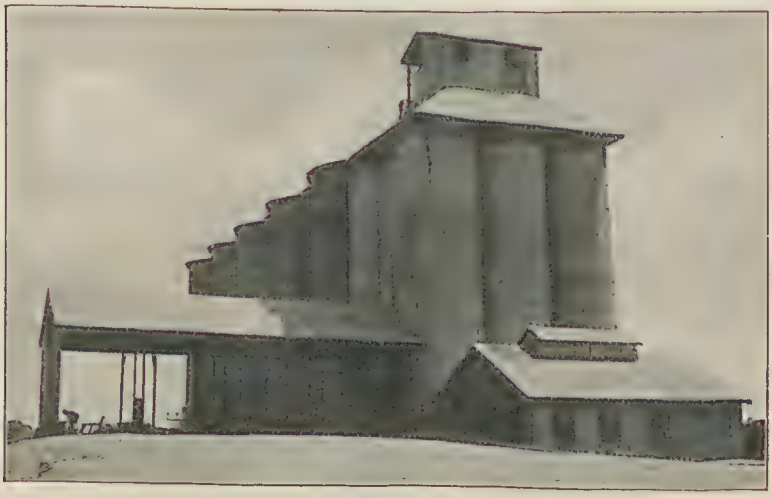


Fig. 56.—Typical Country Elevator, New South Wales.

The following table shows the number of silos used, total receivals at country and terminal elevators, and the percentage of the total crop handled in bulk for the past four seasons.

TABLE SHOWING AMOUNT OF WHEAT HANDLED IN BULK COMPARED WITH TOTAL HARVEST IN NEW SOUTH WALES SINCE THE INCEPTION OF BULK HANDLING.

Season.	No. of Silos Used.	Total Receivals.	Total Harvest.*	Percentage of total crop handled by Silos.
		bushels.	bushels.	%
1920–21	28	1,941,695	55,625,000	3.49
1921–22	28	4,323,495	42,767,000	10.1
1922–23	46	4,596,563	28,668,000	16.03
1923–24	52	6,438,906	33,040,000	19.48

* Figures of total harvest taken from Quarterly Bulletin of Statistics, March, 1924.

The operations of the silos were somewhat restricted during the first three seasons as the country plants were leased to the agents of the Voluntary Wheat Pool, and only Pool wheat was handled.

Last year the system was handled as a general public utility open to all owners or dealers in wheat, and storage warrants were issued to owners whose grain was stored in the silos entitling them to an equal quantity and quality of wheat shown on the warrant.

The terminal silo at Glebe Island is constructed of concrete and steel, and has a storage capacity of 6,500,000 bushels (Fig. 55). Fig. 56 shows a typical country elevator consisting of five large bins each capable of holding 50,000 bushels, and working house containing fourteen smaller bins with a total capacity of 50,000 bushels. It has four wagon unloading bays where four wagons can be unloaded simultaneously, and one of these bays is fitted with a tilting apparatus for dealing with bulk wheat-wagons. The wheat is usually brought to the silos in bags fastened by clips, and when emptied of their contents the bags returned to the farmers.

The Price of Wheat.

The price of wheat is determined by the world conditions of supply and demand. Wheat and rye are the world's principal foodstuffs, and there is sufficient variation in supply and demand of these commodities to cause great fluctuations in price.

In Europe the production of rye is approximately equal to that of wheat, and the production of both crops taken collectively averages about 70 per cent. of that of the entire world.

Among the causes of variation in the world's supply of wheat and rye may be mentioned:—

1. *Climate.*—Variation in climate and in amount of rainfall to which the wheat and rye regions are subject.
2. *Price.*—Variation in acreage, resulting from variations in price.
3. *New Settlement.*—Increase of acreage resulting from settlement of new country.
4. *Competition of other Crops.*—Decrease of acreage due to planting of other crops when there is an unusual demand for live-stock and animal products.
5. *Improvements.*—The continuous advance and improvement in methods of production, communication, and methods of transportation.

Among the causes which may effect a variation in the demand for wheat are:—

1. *War,* which causes variation in the foreign demand.
2. *Standard of Living.*—The standard of living is rising, and this increases the demand for wheat, especially in rye-producing countries.
3. *Substitute for Rice.*—The increasing demand for wheat from Oriental countries, in which rice is being gradually replaced by wheat as a staple article of diet.

The fact that wheat is the staple article of food in the nations of the greatest economic strength tends to keep the demand firm, whilst the

fact that the world's supply of wheat comes from all quarters of the globe tends to prevent any shortage in the general supply.

When wheat prices fall so low that wheat production becomes unprofitable, capital tends to engage in the production of other crops which yield a larger return. When, on the other hand, wheat rises too high, other substitutes are used by the consumer. The demand, therefore, decreases, the price falls, and production is lessened. Thus the forces of supply and demand always seek equilibrium.

The average price of wheat cannot, therefore, be below the cost of production for any considerable period. On the other hand, the price cannot be above what the consumer is willing to pay. Cost of production and value to the consumer are respectively the minimum and maximum limits of price.

Improvements in production methods have decreased the cost of production, and have allowed a larger supply at a lower price to be placed on the market, and in consequence the demand has increased and more wheat is consumed.

Communication and transportation become important factors in the price of wheat wherever export conditions prevail. All markets are affected simultaneously by a change in either supply or demand. The only difference in price which should exist between any two markets, or between what the producer receives for wheat and what the consumer pays, is that resulting from transportation and commercial charges. When, however, a country consumes all the wheat is produces, the price of wheat is fixed within the country, provided there are no restrictions to trade, and the cost of production is not greater than the cost of importing grain.

Some countries impose import duties on grain. The effect of this is to add the amount of the duty to the cost of production, and to make the local price equal to the price of wheat in the foreign market, plus the cost of importation and duty.

The World's Wheat Markets.

Wheat prices are the resultant of supply and demand of wheat in the great markets of the world; the chief are those at London, Liverpool, and Chicago. The prices of wheat cannot be predicted from a knowledge of conditions in any one locality. The whole of the conditions affecting the supply and demand over the wheat belt of the world must be known to forecast the probable trend of wheat prices.

Cables are continually passing between these great wheat markets and all parts of the world. News regarding the condition of the wheat crop in the various regions of the world is received daily. On receipt of such information as a drought in Canada or the United States, failure of the monsoon in India, abundant falls of rain in Australia and Canada, a plague of locusts in Russia, or the outbreak of fungoid or insect pests in any wheat-producing country, the prices of wheat immediately rise or fall according to the relative importance attached to the news. The effect is to concentrate the price-determining influences in these world's markets.

Modern transportation, which enables the grower in Australia, Argentine, Canada, or India to send his wheat to London or Liverpool, and cable communication, which has eliminated the time element in the receipt of news, have resulted in the whole world becoming dependent

for prices on these great markets, where grain traders, dealers, and speculators in wheat buy or sell according to their requirements, or according to their estimates of the probable world supply and demand.

SPECULATION AND "FUTURES."

In Liverpool and Chicago extensive trading is done in what are known technically as "futures" or "wheat options." Wheat is bought or sold for future delivery. The "future" is a contract for the future delivery of wheat without reference to specific lots, made under the rules of some commercial body in a set form by which the conditions as to the unit of amount, the quality, and the time of delivery are fixed, and the determination of the total amount and the price is left open to the contracting parties.

The persons who buy and sell wheat on these exchanges are usually wheat-dealers, millers, and professional speculators. The speculators are divided into two classes, "bulls" and "bears." The "bull" speculator buys wheat for future delivery. He takes the risk of a fall in price in order that he may make a profit from a rise in price. The "bear" speculator short sells wheat, i.e., he sells wheat for forward delivery at a fixed price. He does not own wheat at the time he sells, but he expects to be able to buy it in the market at a lower price before the expiry of his contract.

The market becomes "bullish" and strong when reports of crop damage are recorded, when droughts threaten to affect the world's wheat supply, or when any factors operate which tend to diminish the world's wheat supply. On the other hand, when reports of favorable rains, favorable crop reports, increased wheat shipments are received, the market becomes "bearish" and weak.

The operator who sells in a speculative deal may settle the contract on the day of delivery in two ways—

(1) By delivery of the wheat,
(2) By buying the same quantity of wheat on the same exchange.

If he buys wheat on the same exchange his operations are settled through the clearing house. Only the difference in the cash cost of the two transactions is paid.

The great cereal market of the United States is located in the building of the Chicago Board of Trade. On the floor of the Grain Exchange are the "wheat," "corn," and "oat" pits, where trading in cereals is conducted.

CHICAGO WHEAT PIT.

The Chicago speculators are typical of the great wheat speculators of the world. Their facilities for acquiring information are unsurpassed. The daily weather map issued by the meteorological service informs them of the weather in each of the States of the Union. The Experiment Station reports, and bulletins inform them, of the damage done by insect and fungoid diseases. Their intelligence system keeps them posted regarding the progress of the wheat crop in other countries, and the cables inform them of the fluctuations in price in the principal markets. They have an intimate knowledge of the visible supplies of wheat stored in the world's great terminal elevators, and of the wheat being

transported in car and vessel. The shipping companies afford them information regarding freight rates in all parts of the world. They are constantly determining the ratio between supply and demand, and from this form judgments as to the probable changes in price.

The Chicago Board of Trade is one of the largest organizations for dealing in wheat. Approximately 90 per cent. of the transactions of the " pit " are speculative, neither buyer nor seller expecting to receive or deliver a bushel of grain. It is said that 10,000,000 bushels of wheat have been sold in the Chicago pit in less than ten minutes.

Through the courtesy of the Chicago Board of Trade the writer was able to visit the floor of the exchange and witness the operations of the traders in the " corn " and " oat " pits during 1918.

The wheat pit was closed for the duration of the war, as the Government had fixed the price of wheat at 9s. 2d. per bushel for the 1918

Fig. 57.—Scene in famous Wheat Pit of Chicago.

and 1919 crops. The scenes in the corn and oat pits were very animated. From 9.30 a.m. to 1.30 p.m. each day the floor of the pits was pandemonium with the chorus of yelling and excited brokers buying and selling, and the scurrying of hundreds of messengers and satellites hastening to deliver to the brokers the buying and selling orders with each variation in the market. From an elevated platform an official recorded every fluctuation in the market, and flashed the information to a series of electric " tickers," whence it was transmitted by wire throughout the United States. The unit on the exchange is 5,000 bushels. Immense quantities of wheat, corn, and oats may be bought on the floor of the pit by a sign, a nod, or a scrawl on a trading card. The brokers use manual signs (Fig. 57) to indicate the prices and quantities they are willing to operate on. Despite this the noise in the pit is deafening. The life of the institution depends on the scrupulous

honesty of all its members, and it is more profitable for the operators to make certain honest gains than to destroy the institution by making dishonest ones.

FUNCTION OF SPECULATION.

It is sometimes stated that speculation on the great grain exchanges determines prices regardless of the law of supply and demand, and that high prices for commodities are often caused by the operation of speculators. Such an idea is erroneous, for the freer the competition between the buyers and sellers the more minutely is price regulated by demand and supply. Nowhere is the competition between buyers and sellers keener and freer than on the world's great grain exchanges.

By studying closely and accurately balancing the many intricate factors controlling supply and demand, the grain speculators are able to make fairly accurate estimates of future prices. The speculators buy and sell on their estimates of probable future values.

The most successful speculators are those who get first hand information, and their success is dependent on the accuracy of their estimates. The best facilities for securing early and reliable information are to be found where speculation has been highly organized.

A committee of the British Association for the Advancement of Science in 1900, as a result of an investigation into the effect of "futures" on the prices of wheat and cotton, reported that the prices of commodities subject to dealings in "futures" were lowered both by the reduction of risks and the diminished cost of handling the commodity. "Futures" increase the frequency of price fluctuations, but decrease the range of these fluctuations.

According to Dodlinger*, "Speculation is the fly-wheel which imparts to the modern commercial machine a motion so uniform that all its parts operate continuously and simultaneously. As men produce and consume, as well as exchange, according to comparative prices, it also directs production and consumption in commodities into the most advantageous channels."

The effects of speculation are, therefore, beneficial to the community. Speculators are the men best equipped for securing and interpreting news of variations in supply and demand, and a price is determined which, with slight local variations, prevails throughout the world. Speculation lessens fluctuations in price, for the short seller "keeps down prices by short sales and then keeps them strong by covering purchases."†

The objection to speculation lies in the fact that a group of individuals may secure control of the market and manipulate it as they please. Manipulation may be made either from the "bull" or the "bear" side, but "bear" manipulations are rare. A successful "bear" manipulation consists in selling a commodity short in sufficient quantities to lower the price and to cover these contracts at the low price. A sufficient volume of short sales will depress the price, but the price will immediately rise again when the "bears" commence buying.

Attempts to manipulate the "bull" side of the market are more common. "Bull" manipulations may result in corners. A successful corner results when the market is over-sold, that is when the "bulls" have secured a considerable portion of the supplies and have induced so

* P. T. Dodlinger—Book of Wheat, p. 246. † Emery—"Speculation," p. 121.

much short selling that the supplies in the market are insufficient to cover the volume of short contracts within the required time. Though successful corners in wheat were made in Chicago by Hutchison in 1888, and Leither in 1898, they are now almost impossible of accomplishment owing to the magnitude of the purchases which must be made, and because of the fact that when prices rise rapidly enormous supplies are rushed into the market from unexpected sources.

Though occasionally pernicious practices arise from speculation, it is now generally admitted that speculation in "futures" is beneficial to the community in so far as it tends to keep prices steady, and to direct production into the most advantageous channels.

(*To be continued.*)

GOATS AND BLACKBERRY CONTROL.

In the course of a report regarding the control of the blackberry pest on a farm at Pelorus Valley, Marlborough, by goats, printed in the New Zealand *Journal of Agriculture* for May last, the District Inspector of Stock says:—

The position cannot be shown better than by simply stating the fact that for the past ten years no cutting or clearing—except in the home paddock, where the goats are too timid to feed—has been carried out, and yet the pest is well under control. As a proof of the latter fact, 800 sheep are being carried on about 500 acres of pasturage. This is a much higher rate than the average carrying-capacity of the same class of land. The number of goats kept on the farm, which has an acreage of 700 acres, is 300—both pure and half-bred Angoras.

The use of goats, therefore, has released the owner from carrying out the almost continuous work of clearing, which before the present means were employed was found necessary. But it must be borne in mind that the result achieved can be effected only by the use of sound methods, and by good judgment in the management of goats through the maintenance in health of these animals and their proper distribution over the various blocks on the farm; and last, but not least, by the maintenance of all fences in a goat-proof condition.

That goats can be successfully used against blackberry and to the extent of completely obviating the necessity of cutting and clearing it in the ordinary way is no new discovery. By the use of these animals many land-owners in the district have been enabled to keep blackberry under control. Where, however, sufficient judgment and care are not exercised it would be idle for such owners to expect any great measure of success. In their cases the old method of cutting and clearing will continue to be necessary.

FERTILIZERS AND THE FERTILIZER INDUSTRY.

(Continued from page 715.)

P. Rankin Scott, Chemist for Agriculture, and Will C. Robertson, Supervising Analyst.

Bone Fertilizers.

"Bone fertilizer" is an Australian term for an adulterated bone dust. Some years ago during a period of bone dust shortage some one hit upon the happy expedient of blending rock phosphate, sand, &c., with pure bone dust, thereby considerably increasing the available tonnage, and incidentally, of course, enhancing profits.

As sand could be obtained under contract for six shillings per ton, and high grade rock phosphate, containing 36 per cent. of phosphoric acid, was available at approximately £4 per ton (market price—not manufacturer's cost), the matter of killing two birds with the one stone, viz., increased tonnage and decreased cost, was a most pleasing feature.

Samples of bone dust obtained in the country by an officer of the Laboratory about this time were viewed with suspicion. The subsequent routine analysis disclosed no deficiency in the fertilizing constituents. The Department was not satisfied, however, and research analysis was instituted, with the above interesting result.

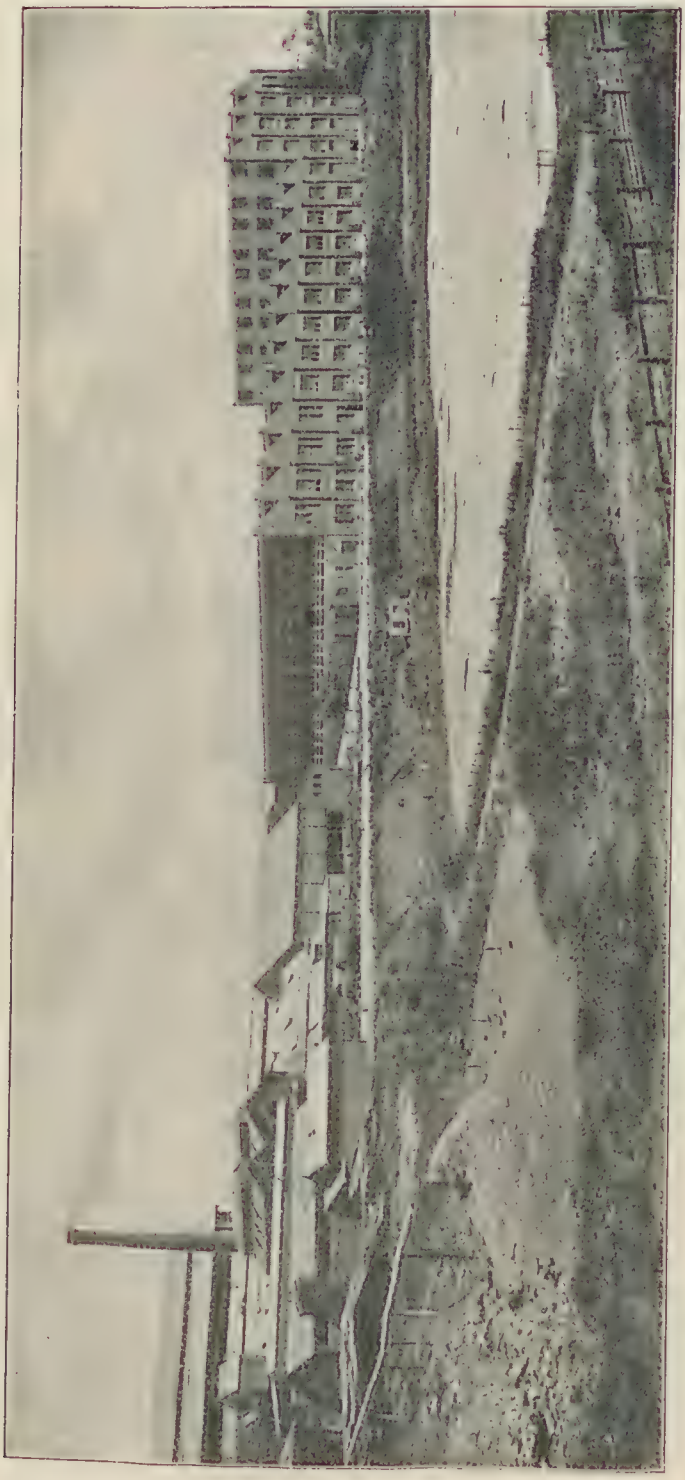
Since then every manufacturer or "blender" of adulterated bone dust has been required to brand it "Bone Fertilizer," and, furthermore, to state on the label the inferior substances from which the manure is manufactured or prepared.

Samples of bone fertilizer have been obtained where the percentage of bone dust has fallen below 40 per cent., so low, in fact, that the resemblance to bone dust is only noticeable by an occasional particle of pure bone and the usual unpleasant odour, the latter being due mainly to the uses of "soup" absorbers.

The manufacture of bone fertilizers takes two forms—(*a*) Bone dust is bought and blended with the inferior and cheaper material, either by hand or machine; (*b*) the filler is fed into the mill proportionately with the digested bone. Manufacture of this description requires little comment.

The usual "fillers," or "adulterants," are rock phosphate, superphosphate, gypsum, marl, and "soup" earth. In isolated instances cheap nitrogenous substances and spent bone char from sugar refining have made their appearance. The latter substance is the residual animal charcoal, or bone-black, after it has become clogged with the colouring matter extracted during the clarification of sugar solutions in sugar refineries.

Animal charcoal is manufactured by heating bones in closed retorts. Moisture, ammonia, and bone oil distils and the residue of calcium phosphate, impregnated with carbon, remains as a jet black powder. It is known as bone char, bone black, or animal charcoal. Spent bone char, i.e., animal charcoal, so clogged with colouring matter as



A City Factory where "Bone and Blood" and "Dried Blood" are made.

to be useless for decolourizing purposes, contains approximately 30 per cent. of phosphoric acid with a small quantity of nitrogen. As it is a by-product from the sugar works it can be obtained at a nominal cost, and is decidedly useful to the manufacturer for building up bone fertilizers.

Whilst bone fertilizers are distinctly inferior to bone dusts, it is not a recognized fact, and it is quite a common occurrence for verbal orders for "bone dust" to be met by delivery of "bone fertilizer."

Bone fertilizers are required to be guaranteed in a different manner from bone dust, in that the mechanical condition is omitted and the percentage of citrate soluble and citrate insoluble phosphoric acid is given in its stead. This works very well as far as phosphoric acid is concerned, but does not overcome the difficulty of over valuing the nitrogen content. The degree of division in the case of bone fertilizer carries little importance in that the fine material is invariably an inferior substance to fine bone.

The composition of bone fertilizers varies with the brand; but as it is required to take the place of bone dust the composition is usually given as something approaching the pure article. The average guarantee would be approximately 3 per cent. nitrogen and 18 per cent. phosphoric acid, but some brands guarantee as low as 2 per cent. nitrogen and 16 per cent. phosphoric acid. The availability of the phosphoric acid will depend upon the proportion of superphosphate and bone dust in the mixture. It also follows that the insolubility of the phosphoric acid is controlled by the proportionate amount of rock phosphate and bone char present.

Most bone fertilizers show a small percentage of water soluble phosphoric acid, due to the admixture of superphosphate, but the amount of water soluble phosphoric acid must not be appreciable, otherwise the fertilizer is regarded as a "bone and super" mixture.

It is doubtful whether the average farmer is fully conversant with the facts as regards bone fertilizer and its composition. It is quite a common occurrence to meet farmers with this fertilizer in their possession. Inquiry leads to the statement that it is the same thing as bone dust, only the law compels the merchant to sell it as "bone fertilizer." This is not so. On other occasions the farmer has ordered "bone dust" and received "bone fertilizer"—the account and invoice certificate both featuring the latter article.

On the whole, however, the reason why bone fertilizer is still on the market is that its price is naturally considerably lower than the price of pure bone dust, and the average farmer is just as keen on bargain-hunting as is the farmer's wife.

As it is a guaranteed article, and the farmer is not fully aware of its composition, sales are readily effected. Bone fertilizer certainly possesses fertilizing value, but the point is that it is dear at its price in comparison with the unadulterated article. The original quality of pure bone dust suffers appreciably on being broken down to form bone fertilizer. A brand of the latter which has been on the market for many years is computed to contain—

Bone dust	50 per cent.
Gypsum or marl	30 per cent.
Rock phosphate	20 per cent.

The analysis of the mixture would be—

Nitrogen	2.25 per cent.
Phosphoric acid, citrate, soluble, 3.50 per cent.; citrate, insoluble, 13.75 per cent.; total ..	17.25 per cent.

The following computations will illustrate the values and at the same moment enlighten the uninitiated in bone fertilizer finance:—

The quoted price for "straight" bone dust in 1924, with an analysis of 4.5-20.5—i.e., 4.5 per cent. of nitrogen and 20.5 per cent. of phosphoric acid was £8 10s. per ton. The price of the bone fertilizer quoted during the same season was £7 12s. 6d. per ton, the analysis being approximately the same as given for the above mixture.

Gypsum is worth 35s. per ton, marl a little less, whilst 80 per cent. rock phosphate, ground ready for mixing, and containing upwards of 36 per cent. phosphoric acid, could be procured from any of the leading firms at £4 12s. 6d. per ton. The bone fertilizer would result in the following outlay:—

	£	*s.*	*d.*
Half ton of "straight bone," at £8 10s.	4	5	0
Three-tenths ton of gypsum or marl, at 35s. ..	0	10	6
One-fifth ton of rock phosphate, at £4 12s. 6d. ..	0	18	6
Apparent cost of bone fertilizer per ton ..	5	14	0
Add cost of mixing, &c.	0	7	6
Total apparent cost	£6	1	6

This is the apparent farmer's cost—not the apparent cost to the manufacturer, which would be appreciably lower.

The calculated value from analysis would be:—

	£	*s.*	*d.*
Nitrogen 2.25 per cent., at 18s.	2	0	6
Phosphoric acid—			
Citrate, soluble, 3.50 per cent., at 6s.	1	1	0
Citrate, insoluble, 13.75 per cent., at 1s. ..		13	9
Calculated value per ton	3	15	3

Knowing that approximately half of the insoluble phosphoric acid is in the form of bone and the remainder as rock phosphate, the calculated value may be increased by using the 5s. and 2s. 4d. units.

	£	*s.*	*d.*
Say 7 per cent at 5s.	1	15	0
And 7 per cent. at 2s. 4d.	0	16	4
Total	2	11	4

This figure replacing the final figure in the calculated value would increase the latter figure to £4 19s. 1d. per ton.

The price asked for the bone fertilizer per ton is **£7 12s. 6d.**

An Admirably Situated Bone-dust Mill.

The apparent cost buying in the open market and mixing would be £6 1s. 6d. per ton. The calculated commercial value would be £4 19s. 1d. per ton. What does this mean? It means, firstly, that the farmer would save at least 20 per cent. (4s. in every pound) by buying in the open market, and manufacturing the bone fertilizer himself, and secondly, even then calculating on unit values, the bone fertilizer would show a value 18.5 per cent. under cost or, plainly put, a further decline (and loss) of 3s. 8d. in every pound expended, making a total loss in value of 7s. 8d. in every pound of the bone fertilizer bill.

Moral.—Buy "bone dust" or "bone and blood" in preference to "bone fertilizer."

There are bone fertilizers on the market manufactured from "blood and bone" and "superphosphate" which are made by mixing 80 parts of "blood and bone" with 20 parts of superphosphate damaged or otherwise. This material is certified not to contain rock phosphate, gypsum, or marl, and is simply a "blood, bone and super" mixture incorrectly termed, to the manufacturers' disadvantage, "bone fertilizer." For what purpose it is hard to foresee. Manufacturers of this class of fertilizers are placed in a different category from those who manufacture pseudo bone dust (bone fertilizer), and in fairness the following computed figures are given to illustrate values.

The analysis of this particular bone fertilizer is given as:—

Nitrogen (as bone, flesh and blood)	4 per cent.
Phosphoric acid—	
Water soluble	1.5 per cent.
Citrate soluble	6.01 per cent.
Citrate insoluble	7.09 per cent.
Total	14.60 per cent.

Presumably it is made by blending 20 per cent. of superphosphate (ordinary and possibly partly reverted) with 80 per cent. of "blood and bone."

The apparent cost per ton of this admixture would be:—

	£	*s.*	*d.*
80 parts "blood and bone" at £9 5s.	7	8	0
20 parts "superphosphate" at £4 10s.		18	0
Cost of mixing		7	6
Apparent farmer's cost	£8	13	6

Calculated value, using 1923-24 unit values:—

	£	*s.*	*d.*
Nitrogen, 4 per cent. at 18s.	3	12	0
Phosphoric acid—			
Water soluble, 1.5 per cent. at 4s. 10d.		7	3
Citrate soluble, 5.01 per cent. at 6s. 10d. + 1 per cent. at 4s. 10d.	1	14	10
Citrate insoluble, 7.09 per cent. at 5s.	1	15	0
Calculated value	£7	9	1
Price asked per ton of fertilizer	£8	5	0

This means that the farmer can buy this particular blend of fertilizer for 8s. 6d. per ton less than he can make it himself by purchasing the fertilizers used in the admixture, and mixing them on the farm. The difference between the calculated value (£7 9s. 1d.) and the price charged per ton of fertilizer (£8 5s.)—approximately 10 per cent.—may be taken as a charge against mixing cost. It will be seen from these figures that this form of "bone fertilizer" represents very fair value. As before mentioned, the fertilizer is a mixture of "blood and bone" with "superphosphate" and should be sold as such.

The time devoted to bone fertilizers in this article is necessary, first and foremost, because they serve no useful purpose (to the farmer), and secondly, because they are a source of annoyance in the administration of the Fertilizers Act.

Bone fertilizer brands are required by the Fertilizers Act to be registered at the office of the Director for Agriculture, and it is necessary for each purchaser to be tendered an invoice certificate guaranteeing the product at the time of sale or before delivery, and, furthermore, each and every bag containing the fertilizer must have a label attached containing such particulars as are given on the exhibit label appended.

MANUFACTURED IN VICTORIA

H. JONES,

BLUFF ROAD, MILLTOWN.

Jones' "Feather Brand" Bone Fertilizer

A mixture of Bonedust, Rock Phosphate, and Gypsum.

Containing—

NITROGEN (as bone and organic)	-	3%
PHOSPHORIC ACID (Citrate Soluble)	-	3%
" " (Citrate Insoluble)		15%
" " Total	-	18%

NET WEIGHT, 187 lb.

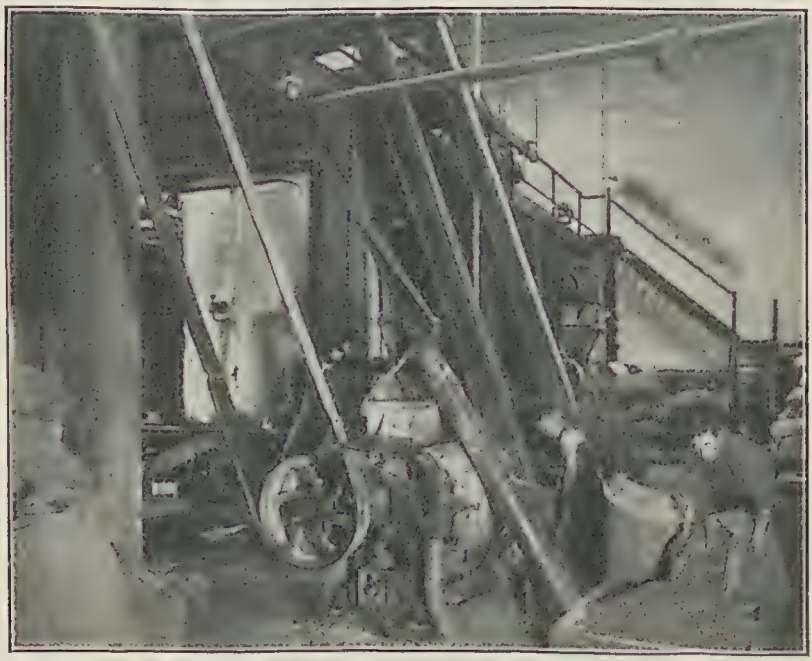
A reference to the annual list of fertilizers on the market which is published in this journal, together with supplementary lists, will give the various brands of bone fertilizers. A study of the analysis will reveal their composition, but the subsequent calculation, using existing unit values, must be used very carefully, for the figures may be misleading. The element of cheapness should not be considered; one has to pay the price for a good article, and the dearest is more often the cheapest in the long run. It is the bottom line that counts. It is satisfactory to note that bone fertilizer manufacture is on the decline, and the annual output of factories manufacturing this line of fertlizer in recent years would probably amount to approximately 2,500 tons.

Castor Meal.

An organic fertilizer, differing from those already described in that it is of vegetable origin, is Castor Meal, the residue remaining after extracting the oil from castor oil beans.

The castor oil plant or *Palma Christi* belongs to the genus *Ricinus*, of which the variety R. *Spectabilis* is said to give the highest yield of oil. The plant is indigenous to India, where it is largely cultivated with the twofold purpose, viz., firstly, for the production of castor oil from the beans (seed), and secondly, the leaves provide food for some kinds of silkworm. The plant grows well in Australia, but high wages prevent its cultivation. Any industry based on the cheap labour of India and the East can afford to give a long start to the same industry installed in sparsely populated White Australia.

The usual method is to cultivate the plant as an annual, but in some parts they are not renewed for two or three years. The yield of beans varies from 5 cwt. to 10 cwt. per acre the first year, while during the third year as much as 2 tons per acre may be harvested from old



Crushing Castor Bean Prior to Extracting Castor Oil. (Extractor in background.)

plants. The price of the beans varies from £25 to £40 per ton, but £27 may be taken as an approximate average.

Cultivation is not difficult or costly, but the harvesting of the beans is a tedious operation and under Australian conditions would militate against success. An interesting feature of the castor-oil plant is the care with which insects avoid it, due, no doubt, to the poisonous properties of the ricine present.

The plant will not flourish on heavy clay soils; it prefers sand or sandy loams.

Manufacture.

Castor meal is the by-product of castor oil manufacture, of which there are two methods, viz:—(1) Extraction of oil by hot pressing;

(2) Extraction of oil by solvents such as benzine. The latter is the method in vogue in Victoria. The mode of procedure is as follows:— The beans, which are almost the size of broad beans and variegated in colour, are cleaned and crushed lightly between rollers. The crushed mass is next elevated and discharged into a large cylindrical tank having a grid or false bottom termed the "extractor." Provision is made at the top of the cylinder for spraying the mass of crushed beans with benzine by a series of perforated spiral pipes.

The top of the "extractor" is fitted with a condenser for the purpose of condensing the vapours of benzine as they arise, and the benzine (oil) reservoir under the false bottom is steam heated. The action

Castor Meal Fertilizer Ready for Market.

is on the principle of the Soxhlet extractor—the benzine filtering through the raw material extracts the castor oil, and finds its way finally into the reservoir under the false bottom. Here the the benzine is volatilized, leaving the heavier non-volatile (at the temperature) castor oil; the benzine vapours permeate the partly extracted mass and are condensed above to be sprayed once again on the raw material to dissolve a further quantity of oil. This action goes on for some hours until the residue in the tank is finally adjudged free of castor oil.

The residue of rough crushed castor seed (oil free) is discharged from the extractor and allowed to dry. The benzine containing the castor oil is heated, until the benzine is all distilled off and condensed

for future use. The castor oil which remains is refined, packed and marketed.

The rough dry residual castor seed is conveyed and fed into the grinding mill, which consists of a box containing a central shaft to which is attached a number of "leaves" or "beaters." The shaft is driven at high speed, with the result that the coarse castor seed is disintegrated into a fairly fine powder. As the latter discharges from the mill it is bagged, and is ready for the market. The analysis of castor meal fertilizer is as follows:—

Nitrogen (organic)	5 per cent.
Phosphoric acid	2 per cent.
Potash	2 per cent.

It varies very slightly, but occasional samples of this fertilizer contain as high as 6 per cent. of nitrogen.

The output of castor meal fertilizer is approximately 2,000 tons per annum, but the larger proportion of this is sent outside the State.

The fertilizer has many advantages. In the first place it is organic, and therefore, any application to the soil will increase the humus content; secondly, whilst it is a nitrogenous fertilizer, it contains moderate amounts of phosphoric acid and potash, and all three plant foods would be in a condition of moderate availability.

It is a moot point whether the extra grinding of the castor seed residue compensates for the increased costs.

Castor meal fertilizer should be regarded as a fertilizer which acts both as a soil improver and a manure, and providing the price is right there should not be one ton exported. The suggestion is to use the fertilizer as a top dressing at the rate of at least 5 cwt. per acre immediately after ploughing. This would permit weathering for at least three months, and result in plant food being available at the time of germination or planting, and right through the critical growing period of the crop.

As castor meal is prepared by artificial means it is a fertilizer within the meaning of the Fertilizer Acts, and consequently, has to be labelled and guaranteed in a similar manner to all other artificial fertilizers.

BROWN & Co. Pty. Ltd.

SOUTH MELBOURNE.

○ "ALLIN" CASTOR MEAL FERTILIZER

Nitrogen (organic) - - -	5%
Phosphoric Acid - - -	2%
Potash - - - - -	2%

MANUFACTURED IN VICTORIA. NET WEIGHT, 150 LB.

(To be continued.)

MURRAYVILLE CROP AND FALLOW COMPETITION, 1924.

Report of the Judge, George S. Gordon, Science Field Officer.

The members of the Murrayville Agricultural Society may be congratulated on the enthusiastic manner in which most of the competitors entered into the spirit of the second Crop and Fallow Competition. The number of entries increased from 16 in 1923 to 26 this year. The competition not only aroused a healthy spirit of friendly rivalry, but most of the competitors were apparently actuated by the higher motive of advancing the progress and prosperity of the district in general and their own cultural methods in particular, than that of merely winning a prize. Incidentally, of course, they recognize that improved methods mean better and more profitable crops for themselves. As pointed out in the comprehensive report of the judge last year, progressive farmers realize that when the pioneering stage associated with Mallee land has been successfully passed, they must practice more modern and improved methods in order to produce maximum crops. Increased production, brought about by better farming, makes for greater prosperity and a higher standard of civilization. The value of the Society in the district is in direct proportion to the success it achieves in assisting to develop agriculture and live-stock husbandry on correct lines, and inducing the many to practice the improved methods of the comparatively few good agriculturalists.

The experience of older districts is a very valuable guide to the factors essential to the production of profitable crops. It does not necessarily follow, however, that methods which have proved suitable in one district may—in their entirety—be equally successful in another having somewhat different conditions of soil, climate, rainfall, &c. Modifications calculated to suit local conditions require thorough consideration and careful testing over a number of years, in order to evolve the best system of agriculture for any particular district.

To a greater or less extent, practically every district also has its own special problems to solve, and crop and fallow competitions afford a valuable opportunity to obtain data bearing on these. By means of the competition local interest is focussed on the competing crops. Each becomes a subject for discussion, particularly so if any innovations have been introduced. Successful practice, when sufficiently demonstrated, soon spreads throughout the district.

The Seasonal Conditions.

While the average annual rainfall at Murrayville is about 13 inches, that for the year 1924 to date of judging (18th November) amounted to 15¼ inches. Nine and a half inches of this fell during the growing period of the crops (April to October inclusive) and 2¼ inches fell in the first half of November. With the exception of a dry spell during the period of germination and early growth, the rainfall was good, about 2 inches falling each month from August to the middle of November. It should, therefore, be remembered while considering the crops and fallows, that the season was rather abnormal. It favoured late-sown crops and late varieties to such an extent that possibly

it would be unwise to accept this year's results as typical of an average season.

The Competition and Awards, 1924.

The winning wheat crop was that exhibited by Mr. H. J. Wiltshire, which was awarded 92 points out of a possible 100. It is interesting to note that it was grown on the winning fallow of the previous year. The soil is a reddish loam with a clay sub-soil, and is fairly typical of "big" Mallee country. It was ploughed 4½ inches in July, 1923, then harrowed; during August it was worked with a scarifier and harrowed; scarified early in September and again harrowed. Three more cultivations with a tyne cultivator, each followed by a harrowing, were given before the crop was sown. This was done with a combine-drill, and a harrowing followed. It was also harrowed thirteen days after the plants appeared. The crop comprised areas of Federation and Warden, with a smaller section of Gallipoli. The seed was pickled with bluestone, and was sown during the last week of May and the first week of June at the rate of 65 lb. per acre with 150 lb. of 22 per cent. superphosphate.

A Crop of Warden Wheat.

Section of the winning crop. Grown by Mr. H. J. Wiltshire, Murrayville.

The illustrations will help to convey some idea of the general appearance of the very fine crop resulting from such thorough cultivation. The section of Warden stood up like a wall, was clean, pure, and practically free from weeds and disease, and was very even. The Federation section was also very even, pure, and comparatively free from weeds, but showed a little "flag" and "loose" smut. The small area of Gallipoli also contained "loose" smut and a few foreign plants, but otherwise was typical of this variety.

The second place was awarded to Messrs. D. Stewart and Sons for a very even crop, which also included three varieties—Federation, Wannon, and Gallipoli Selection 58/1—(the improved free-stripping selection). The Wimmera practice of late sowing was tried with this crop, the seed being sown between 21st June and 1st July, at the rate of 75 lb. of seed with 112 lb. of 22 per cent. superphosphate per acre. A very nice, even, pure crop of medium height resulted. No doubt the late rains

materially helped to support the later seeding, but this cannot be recommended for the Mallee in average seasons. The crop lost points chiefly on account of fairly numerous small patches of take-all, and the presence of barley grass, mustard, &c.

A Crop of Federation Wheat.

Section of the winning crop. Grown by Mr. H. J. Wiltshire, Murrayville.

The Winning Crop of Algerian Oats.

Grown by Mr. C. H. B. Ross, Panitya.

Mr. T. E. Cox takes third place with an even crop of Improved Gluyas, which was very free from disease, and fairly pure, but contained a number of weeds. It was sown in early June at the rate of 75 lbs. of seed with 180 lbs. of 18 per cent. superphosphate per acre.

Oat Crops.

Two particularly good Algerian oat crops were entered. The chief defects in both were the presence of "loose" smut and barley. Pickling with formalin is recommended for the treatment of seed oats infected with "loose" smut. Both crops were sown on fallow in April; that of Mr. C. H. B. Ross, the winning crop, was seeded at the rate of 60 lb. with 70 lb. of superphosphate per acre; while the second crop, that of Mr. J. J. Hallett, had had the light seeding of 38 lb. with 70 lb. of 22 per cent. superphosphate per acre. The former crop was being cut when inspected, and the latter was judged in the stook.

Details of the points awarded to the various competitiors are given in the following table:—

Table I.—Details of Points Awarded to Competitors in (A) Wheat Section and (B) Oat Section.

Name of Competitor.	Apparent Yield.	Purity of Type.	Freedom from Disease.	Absence of Weeds.	Evenness.	Total.
Maximum Points	**35**	**20**	**15**	**15**	**15**	**100**
(A.) Wheat Section.						
H. J. Wiltshire	33	19	12	14	14	92
D. Stewart & Sons ..	32	19	10	13	14	88
T. E. Cox	32	18	13	9	14	86
F. A. J. Pahl	30	18	12	12	11	83
C. H. B. Ross	26	19	8	13	13	79
J. J. Hallett	25	16	11	9	12	73
W. Jacob	28	17	8	8	8	69
A. Job	23	13	9	9	10	64
(B.) Oat Section.						
C. H. B. Ross	34	18	12	13	14	91
J. J. Hallett	31	18	12	14	14	89

The Fallows.

Judging the fallows for moisture-content was rendered unsatisfactory by the heavy rains which fell just prior to inspection. Practically all contained a plentiful supply of moisture, and it was not possible to estimate the amount conserved by good cultivation prior to the heavy rain in November. Full points for moisture were, therefore, awarded in all cases. It was also difficult to compare fallows on varying soil types, such as land with numerous limestone outcrops, strong and somewhat heavy flats, light sandy rises, and yet another class, where these varying types were combined in different sections of one exhibit. It is obvious that soils differing so widely require a corresponding variation in treatment.

Some of the fallows had been cultivated or harrowed after the rain referred to and before judging. In these a considerable amount of moisture will be conserved for the use of next year's crop. In other cases harvesting operations in connexion with oats had prevented any cultivation, and

there seemed little chance of the teams being available for fallow cultivation till after harvest. One exhibit had been summer-fallowed, and, judging by its freedom from weeds, had been well worked for some time. When inspected, however, the surface had caked, and was cracking badly. In these instances, and particularly where the surface mulch was somewhat neglected prior to the rain, the greater portion of the moisture will be lost.

The main points in regard to fallowing in the Mallee are those of moisture conservation—both by maintaining a good soil mulch and the killing of weeds—and the preparation of a suitable seed bed. It cannot be too strongly urged that a well-prepared fallow is the essential groundwork of a good crop. In several cases dead barley grass plants on an otherwise clean fallow, indicated that the cultivation had been neglected at an earlier period, and that this take-all host had established itself. Yet another type of exhibit contained small depressions, which held the water to such an extent that these portions were "puddled" when the necessary cultivation was given to the rest of the field. It was undoubtedly better to cultivate the major portion of the field at the expense of the wet spots, but, as a whole, it could not be regarded as a first class fallow.

Particulars of the points allotted in the Fallow Section are given in the table below:—

TABLE II.—DETAILS OF POINTS AWARDED IN THE FALLOW SECTION.

Name of Competitor.	Moisture.	Mulch.	Absence of Weeds.	Cultivation.	Total.
Maximum points	**25**	**25**	**25**	**25**	**100**
Messrs. D. Stewart and Sons (No. 1)	25	23	24	22	94
Messrs. D. Stewart and Sons (No. 2)	25	22	23	22	92
F. A. J. Pahl	25	20	23	23	91
G. J. Cossens	25	22	22	20	89
H. J. Wiltshire	25	21	23	20	89
F. Pierson	25	22	22	19	88
J. Parkinson	25	20	21	21	87
F. Boettcher	25	21	21	20	87
F. J. J. Schultz (No. 2) ..	25	20	20	19	84
F. J. J. Schultz (No. 1) ..	25	18	21	19	83
E. Malone	25	19	20	17	81
J. J. Hallett	25	18	18	16	77
A. E. Ross	25	10	24	15	74
F. W. Ross	25	14	18	14	71
W. Jacob	25	14	17	14	70
T. E. Cox	25	14	16	13	68

Take-all.

Probably the most serious problem in the district is that of the disease known as take-all. This disease is carried on from year to year chiefly by continuous cropping with wheat and the fact that it can exist on such plants as self-sown wheat, barley, barley grass, spear grass, &c.

From these hosts the soil is infected, and the disease carried on to the succeeding wheat crop. Even in some of the competing crops—which were no doubt above the average of the district—it considerably reduced yields.

Any means whereby this serious menace to the wheat crops can be controlled or eliminated is, therefore, of prime importance, and to this end the following methods of starving out the fungus, together with suggestions originating from observations made while judging this year's crops, are given:—

1. Clean fallowing in order to kill out any plants which may act as hosts for the fungus. This seems to be particularly necessary on limestone outcrops and around burnt stumps, where the cultivator often misses a few weeds when the tynes are clearing the stump or stone. It was noticed that a stump or stone with a few barley grass plants was frequently located near the centre of take-all patches. In these cases, not only was the host plant present, but the ashes from the burnt stump

New Cross-bred Wheats being Tested by Mr. H. J. Wiltshire, Murrayville.

on the one hand and the limestone itself on the other created alkaline-soil conditions particularly favorable to the disease. What are known locally as "rubbly" limestone patches also seemed to foster the disease.

2. The introduction of oats, sown on clean fallow, as a regular crop in the rotation. The oat crop is practically immune to take-all, and for this reason, if thickly sown, helps to starve out the disease. On soils badly affected with take-all the rotation, fallow, oats fallow, wheat would cope with the trouble better than where wheat was sown after the first fallow period.

3. A firm seed bed with good consolidation and even mulch. It was observed that take-all seemed to be worst on light, loose, and drifted soils. Working the fallow when too dry is also said to accentuate the evil.

4. The liberal use of superphosphate appeared to help in warding off the disease. Possibly this is because of the increased vigour and more healthy growth of well-manured crops. When associated with the

moisture conserved in a well-worked fallow the heavier dressings of superphosphate also make for better yields and greater profits.

5. The choice of variety. Improved Gluyas seemed to be the most resistant variety, and this particular wheat also seems to suit the light soils, which are more subject to the disease. Federation seemed rather susceptible to take-all.

Sheep.

The necessary work of clearing the land, high prices for fencing materials, &c., and the consequent dearth of suitable fences, have hitherto hindered the general introduction of sheep to the district. As these conditions are overcome, there will be an increasing interest in and demand for sheep, and, as time goes by, a greater number will be carried. The generally better condition of the fallows on farms where sheep are kept was noticeable, and even where the cultural operations were neglected the sheep held the weeds in check.

The value of oats as a fodder and grain crop on the farm is well recognized, but in view of the present high prices for sheep and wool, as well as the advisability of growing such a crop to check take-all, it would be well worth while to try the growing of oats for grazing off by sheep. In this connexion, the following figures relating to the Feeding-off Tests on the Green Manurial Field at the State Research Farm, Werribee, are of interest:—

TABLE III.—SHOWING COMPARATIVE ANNUAL AVERAGE GRAZING VALUES OF VARIOUS FORAGES OVER FIVE YEARS' PERIOD (1919-1923), AT THE STATE RESEARCH FARM, WERRIBEE.

Crop.	Live Weight Increase. Lb. per Acre.	Sheep Days. Per Acre.	Values of Live Weight Increase. Per Acre.	Values of Wool Produced. Per Acre.	Total Feeding Values. Per Acre.
			£ s. d.	£ s. d.	£ s. d.
Oats	321·7	588·7	4 0 5	0 12 3	4 12 8
Barley	257·6	435·4	3 4 5	0 9 1	3 13 6
Peas	129·3	309·1	1 12 4	0 6 5	1 18 9
Rape	117·4	281·4	1 9 4	0 5 10	1 15 2

NOTE.—In this table 3d. has been allowed for each pound actual increase in live weight. An allowance for each sheep sustained for one day has also been made on the basis of 7s. 8d. per year, i.e., one farthing per day for increased value of wool of the sheep used.

The term "sheep days" refers to the number of days for which the crop would maintain one sheep, or the number of sheep which the crop would maintain for one day. Thus the figures are obtained by multiplying the number of sheep by the number of days they were on the plot.

General.

Weeds in great variety are already numerous in this comparatively new district. The most prevalent—Indian hedge mustard—probably ranks next to take-all as a cause of poor yields. Fortunately, however, the methods recommended for dealing with take-all will, in the main, also serve for mustard. Harrowing before the crop appears, or when the young wheat plants are sufficiently "tough" to stand harrowing, might also be tried. Harrowing will kill young seedlings, but not plants with

a good root hold. Varieties such as Improved Gluyas and other wheats which make a quick, early growth seem to be able to keep ahead of the weeds.

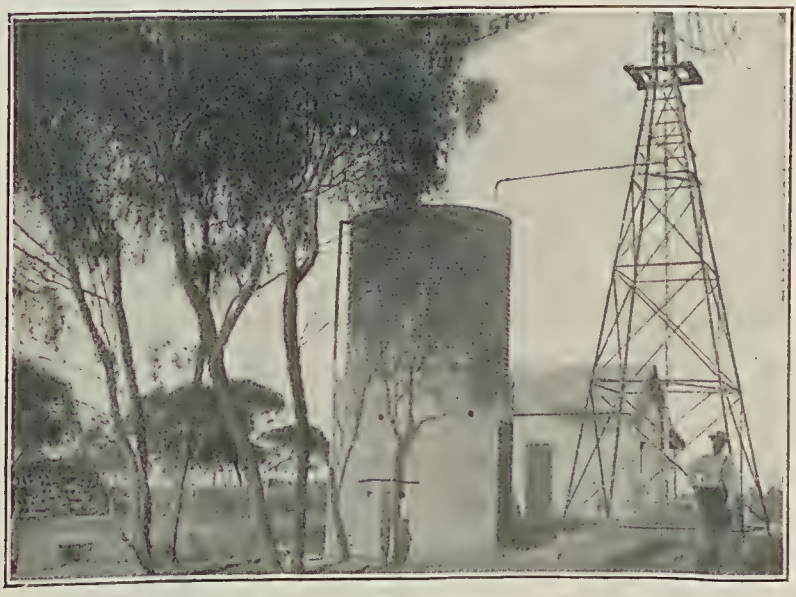
The "Home" Garden of Mr. J. J. Schultz.

Located on a sandy loam rise, sheltered by pine and other native timber, and containing a small vineyard and a well-assorted collection of fruit trees, etc. The garden is not irrigated.

An Attractive and Serviceable Garage and Men's Quarters.

Fire and ant-proof, and said to be cheaper than if built of timber. Built in rough-cast concrete, with local sand and stone, by Mr. T. E. Cox, Panitya.

Though seen under favoured seasonal conditions, late varieties, such as Purple Straw, did not promise well. At the same time, the section of Warden in the winning crop was undoubtedly a fine crop, and



A Neat, Strong, and Useful Tank-stand.

Built by Mr. T. E. Boettcher, Murrayville. Walls of lime-concrete, made from lime burnt on the farm, and local sand and stone. Top of reinforced concrete. This tank-stand may also be used as a mouse-proof store-room and as a bacon smoke-house.

Motor Train—An Aid to Country Development.

indicated what could be grown at Murrayville on a well-worked fallow with a good seasonal rainfall. This variety, too, has a good "covering" habit in early growth. Federation does not seem to give such consistently good results as in the Wimmera and appeared to do best in the heavier soils. Other varieties seen were Mac's White, Gallipoli Selection 58/1, Major, Wannon, Dollar, Queen Fan, &c. It costs no more to grow one variety of wheat than another, yet the choice of a suitable variety may give increased returns equal to the rent of the land or, in fact, make all the difference between profit and loss on the crop. Wheats which may be recommended as worthy of trial are the new crossbreds, Rajah and Ranee, and the improved free stripping selection of Gallipoli known as Selection 58/1. Rajah is an early wheat, which has done particularly well in the Mallee, and, like Gluyas, makes a quick, early growth.

Pleasing features noticed during the visit were the evident sense of confidence in the district shown by residents, the desire to develop its resources to the utmost, the assured water supply from bores, and the nice gardens, &c., which the water supply made possible.

The primary object of the farmer is to make a living, but his farm should also be made a home in the truest sense of the word. The gardens, orchards, farm conveniences, and the air of prosperity indicated by general improvements, telephones, motor cars, &c., all point to the fact that the "home" aspect of farm life is not being overlooked at Murrayville.

In several instances the farmers' sons were encouraged to take a deeper interest in the farm work by co-operation with their parents or by entering exhibits themselves. All this indicates a desire for improvement, and will do something to stay the drift to the city—a trouble to be met with in so many rural districts.

Having perused last year's report, seen this year's crops and fallows, and discussed matters with those interested, I can honestly say that there has been a definite improvement in the agriculture of the district during the past year.

In conclusion, I desire to express appreciation of the manner in which judging was facilitated by those who gave their time and cars, and of the kindness and organizing ability of the secretary, Mr. W. H. Kruse, and my sincere thanks for the hospitality extended to me.

POISONING SPARROWS.

The following is a method which has been found effective in killing sparrows in Canterbury, New Zealand. Moisten 12 lb. of wheat with milk, and add 1 oz. of finely-powdered strychnine. The birds should be fed with ordinary wheat for a few days before poisoning. Spread the grain immediately after treating it with the poison, and only in the places where the birds have already been fed.—*New Zealand Journal of Agriculture.*

LINDENOW MAIZE VARIETY COMPETITION.

Report of Judge, L. C. Bartels, B.Ag.Sc., Chief Irrigation Field Officer, Department of Agriculture.

I have much pleasure in presenting this report of the first "Variety" Competition conducted by your Society under the supervision of the Department of Agriculture, because it marks an endeavour by the Society to work for the betterment of agricultural methods in the district. In this the members are following the lead of other Agricultural Societies throughout the State which, for example, in the wheat-growing areas, by the institution of crop competitions, have done much to raise the standard of farming in their districts. I am pleased, also, that the suggestion that such a competition might profitably be undertaken has been justified by the results, which demonstrate the variations in the quality of maize grown by different farmers, and the benefits of careful selection of seed.

In a maize district, every farmer who systematically selects his seed produces a more or less distinct type, obviously depending on the variety with which he commences, and on his idea of what constitutes the best type.

The Competition.

The varieties brought together at Lindenow illustrate this very well. Twenty varieties were obtained from leading farmers and sown in adjoining plots on the farm of Mr. T. W. Murphy. Four rows of each were put in, and each plot was 9 chains long. In all there were 24 plots, one variety being sown in five plots throughout the series as a check.

The plots were sown on 1st November, 1923. They were not manured. Notes were taken during growth and at harvest time.

The seasonal conditions were abnormal. The cool summer prolonged the growing period and delayed ripening, and while heavy yields were obtained generally, several of the varieties did not ripen, and so were handicapped to an extent that would not have obtained in a normal season.

The plots were picked by departmental officers at the beginning of July, and judging was done by Mr. J. Brake, Chief Field Officer, and myself. The ears were stored and threshed in October. Points were allowed on the following system:—

	Points.
Yield of shelled grain	75
Uniformity of plot (an index to uniformity and germinability of seed—uniformity of selected types. Hardiness of plants and proportion of barren stalks, &c.)	5
Character of plants (maturity, strength and character of stalks, height of ear, size of shank, husk proportion to ear)	10
Character of ear (ripeness, trueness to type, shape, weight, length and uniformity, filling at butt and tip, thickness of core, depth and shape of grain, colour of core, brightness of grain, indentation, spacings of rows)	7
Freedom from disease (extent to which smut affects ears, soundness of ear and grain)	3
Total	100

Competition Results.

Name of Competitor.	Yield.	Uniformity of Plot.	Character of Plant.	Character of Ear.	Freedom from Disease.	Total.
Maximum Points ..	**75**	**5**	**10**	**7**	**3**	**100**
F. W. Smith (Selection from Brewer's Dent)	75	4	6	5	2	92
Telfer Bros. (own selection) ..	72	4	8	5	2	91
W. Kerton (own selection) ..	72	4	8	5	2	91
F. W. Smith (own selection)..	71	4	7	4	2	88
J. R. Keating	70	4	7	4	2	87
H. Fisher, Orbost (Early Dent)	65	4	9	5	2	85
Jas. Murphy	67	4	7	5	2	85
Ross Bros.	67	4	7	5	2	85
F. Murphy	66	4	7	4	2	83
C. Fountain	64	4	8	5	2	83
Pascal, Orbost (Brewer's Dent)	65	4	6	6	2	83
H. Fisher, Orbost (Selection from F. Y. Dent) ..	64	4	7	5	2	82
J. H. Evans	61	4	6	4	2	77
H. Hall	59	4	7	5	2	77
G. Ray (Golden King) ..	62	4	5	4	2	77
— Yates, Orbost	56	4	6	4	2	72
P. D. Watt, Orbost (Corn-planter)	47	4	6	4	2	63
W. A. Keating (Craig Mitchell)	48	4	5	4	1	62
M. Luby	45	3	6	4	2	60
Telfer Bros. (Imported Gold-mine)	42	3	9	4	2	60

Comments on Results.

The winning variety was Mr. F. W. Smith's selection from Brewer's Dent, which made a fairly uniform plot, and yielded at the rate of 99.4 bushels per acre. This selection is mid-seasonal, and it showed a tendency to stool. The plants were comparatively tall, and exhibited a weakness in the stalk, and at harvest many were broken off (stormy weather prior to harvest had severely tested all the varieties in this regard). The ears were well placed on the stalk, and they were mostly hanging. Husk protection was fairly good. The ears were variable in character and showed an admixture of foreign types, though most conformed to the varietal characters; they were comparatively small, with closely set and narrow but deep grain. A little smut was in evidence.

Messrs. Telfer Bros.' entry of their own selection of maize showed good germination, and made a fairly regular and uniform plot. The plants were comparatively tall, and for the most part upstanding. Most of the ears were ripe at harvest time. The stems were of medium thickness, and the ears were not placed too high. Most of them hung down. Husk protection was good in nearly all cases. The ears were not of uniform character, and some were unripe. The grain showed smooth indentation, but a proportion of prickly ears developed. Ears were well filled, but the grain was comparatively thick, and in many cases the butts of the ears were swollen.

The plot from Mr. W. Kerton's maize showed a fair degree of consistency, and the plants were of medium height and stood erect. The

maize ripened fairly well, although a number of the plants were late in maturing. The ears were well placed, and mostly hanging; they were well filled with grain of average quality. The indentation of the grain was rough, and some of the grain was beaked. The plants showed very little smut, but some dry-rot was apparent.

The slow ripening of the maize severely handicapped the later varieties. Likewise, those plots grown from seed obtained in other localities failed, e.g., with the exception of Fisher's Early Dent, the maize from Orbost did not compare favorably with Lindenow maize, probably because of the change in environment. This applies also to Mr. Ray's maize, and to that entered by Mr. Luby, and to the imported seed of Messrs. Telfer Bros. This last maize, "Goldmine," had been obtained from the United States of America two years previously, and the germination was irregular. It did comparatively well, and was

Sowing the Maize Crop.

the earliest maturing of all the plots, and gave a fine sample of grain, although it had an objectionable beak. It must be said that the character of grain often gives a variety of maize more popularity than it deserves, and the practice of growing seed because of the attractive appearance of the grain is not always to be commended.

Need for Improvement by Selection.

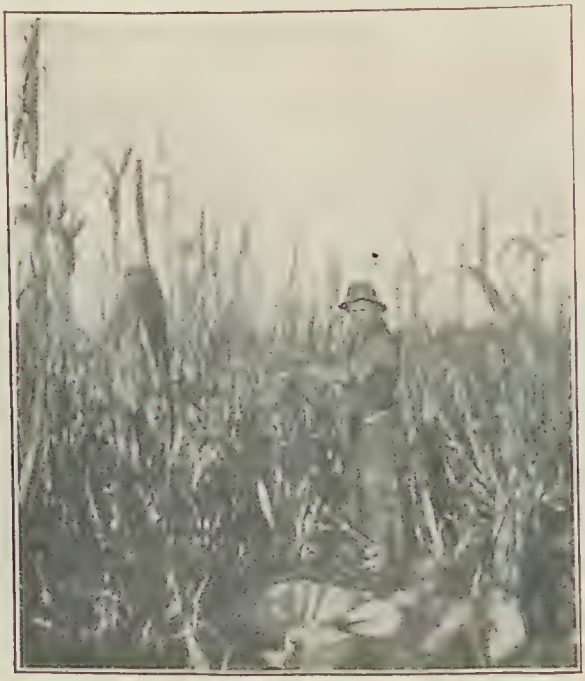
Only a small proportion of ears in a field are large. Most of them are irregular, and many are small and unproductive. In addition many stalks are barren. Mongrel varieties are commonly grown. This shows the need for systematic improvement.

Maize is naturally cross-fertilized, and there are an unlimited number of combinations of characters represented in the growing plants. Under particular climatic conditions, the weak combinations

are destroyed or exposed, and the selector should endeavour to eliminate them; if mongrel ears are grown, repeated segregation of characters leads to the recurrence of weaklings.

The development of maize during the last century has been remarkable, for during that time there have been evolved from five varieties the numerous varieties which make possible the culture of this crop over a wide range of conditions. The five varieties were Big Yellow, Little Yellow, Big White, Little White (all flint maize), and Gourd Seed, probably the forerunner of Dent maize of to-day.

We are far from the limits of possible improvement. The maize-grower should aim at increasing the uniformity of his crop by selecting



Picking Maize.

only the best ears. The production of uniformly better ears will improve yields, and the percentage of barren stalks will be reduced.

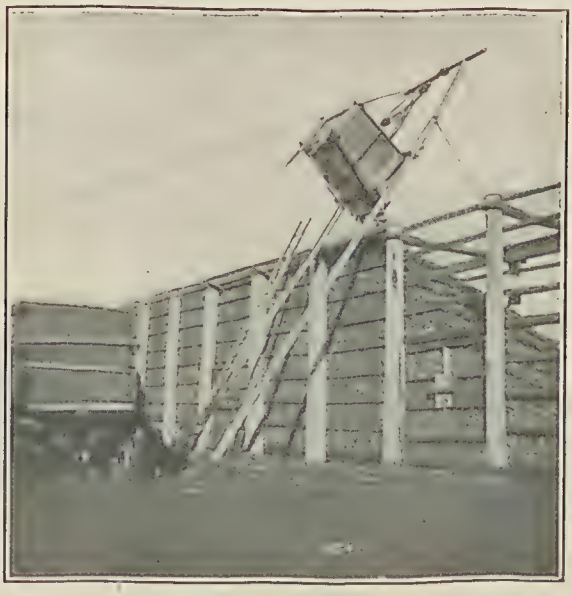
In endeavouring to improve the quality of maize by selection, it is wise to begin on a variety adapted to local conditions, and there is no maize so well suited to a particular locality as a good variety which has been grown there, and intelligently selected for a number of years. One should begin on a variety having a good-sized grain with a large germ. The core should be of medium size, and the ear well proportioned.

For general purposes, Dent maize is superior; it has been the subject of great care in development. Under selection, varieties change in response to the effect of climate and soil conditions, not that these environmental conditions have themselves effected a change in characters, or that selection has created new qualities, but in the varied types

of plants in any maize population particular strains have shown their adaptability by better development, and have been selected and propagated.

Select Maize in the Field, not in the Crib.

One important way in which a strain of maize may be improved is by shortening the growing period so that the crop will ripen properly in a normal season—in other words, by the elimination of late-maturing types. In selecting seed maize from the crib, early ripened and late ripened ears will be picked together, because they cannot be distinguished, and a bigger proportion of late ears will be included; but if an examination of the standing crop is made in autumn, the earlier ripening ears will then be found often in the same hill as others growing



Filling the Crib.

under precisely the same conditions which are late ripening. Maturity should not be sacrificed for size.

In selecting in the field, one should consider the strength and character of the parent stalk; the height of the ear on the stalk, and the size of the shank. These characters will nearly always be transmitted, and strongly influence the development of the ears. Large stalks of medium height with broad leaves are desired. The stalk need not necessarily be tall; but should be strong and vigorous, and the best formed, and often the earliest maturing ears are at a medium height. If the shank is not too short and coarse, it will permit the ear to hang with tip down.

It is not practicable for a farmer to select all his seed in the field. The proportion of maize to core, the shape of the ear, the filling of the ends, are all subject to the selector's influence.

If a mongrel strain be selected, it will require years of most careful work to get the variety ready for improvement. Colour is not very important. (At Lindenow,. some growers have a preference for red tinted grain, but others dislike it.)

Methods at Lindenow.

Speaking generally, the methods of maize-growers at Lindenow are of a high standard; they recognize the need for thorough cultivation in preparing the seed bed, and in keeping the crop free from weeds. Their experience shows them that early planting in properly prepared land is best, leading to earlier ripening and drier cars at picking time. It may be stated here that seed maize with a good germ will withstand better any unfavorable conditions which may attend the early planting.

The best thickness to plant can be determined only by test over a number of years. Obviously, in a dry year the heavier sowings are unfavorable, but the land at Lindenow will support at least three stalks per hill.

An Up-to-date Crib.

Stooling of maize has been overcome by selection, but thin sowing will induce suckering, particularly in fertile land where moisture is abundant.

The Department of Agriculture has initiated manurial tests, and during the 1924-25 season the effect of superphosphate in varying quantities, and in combination with nitrogenous manures and potassium sulphate, will be determined, and other forms of phosphatic manure will be tried. It is anticipated that definite evidence for the guidance of growers will be obtained.

The system of continuous cropping must have reduced the fertility even of these rich river flats. This condition may be amended by suitable manuring, but it is not unlikely that in the future the wisdom of occasionally introducing other crops in rotation with maize will be demonstrated.

Messrs. J. Brake and F. Dodgshun were my co-workers in the harvesting of the plots; and I have to express thanks to Mr. Murphy and his staff for their valuable assistance.

ARTIFICIAL FERTILIZERS.

(Registered under the Fertilizers Act for the year 1925.)

By P. Rankin Scott, Chemist for Agriculture.

What is a Fertilizer?

A fertilizer is defined under the Act to be any material containing nitrogen, phosphoric acid, or potash which has been manufactured, produced, or prepared in any manner for the purpose of fertilizing the soil or supplying nutriment to the plant.

Registration of Brands.

All manufacturers or importers of fertilizers who intend offering for sale any such material as above described are required to make application on or before the 1st November in each year to the Director of Agriculture for the registration of a brand in respect to any such fertilizer. Every such application must set forth:—

(*a*) The full name and place of business of the applicant.
(*b*) The figure, trade mark, or other sign to be attached to or associated with the fertilizer.
(*c*) A statement of the result of a chemical analysis, stating the proportion per centum in which the fertilizer contains nitrogen, phosphoric acid, or potash, and the respective forms in which they occur.
(*d*) The retail price per ton of the fertilizer.

The Act requires every dealer to give the buyer an invoice certificate and to affix to every package a plainly-printed label. The certificate should be in the form prescribed by the Act, and state (*a*) the name of the dealer; (*b*) the name of the purchaser; (*c*) the weight; (*d*) the name of the fertilizer, also the analysis stating the per centum of nitrogen, phosphoric acid, and potash, and the forms in which they respectively are present. In the case of bonedust the per centum of fine and coarse material should be declared. Every bag of fertilizer sold must have attached a plainly-printed label clearly and truly certifying—

(*a*) The name and address of the manufacturer or importer.
(*b*) The figure, trade mark, or other sign under which the fertilizer is sold.
(*c*) The analysis, stating the per centum of nitrogen, phosphoric acid, or potash and the forms in which they respectively are present. In the case of bonedust the per centum of fine and coarse material.
(*d*) The number of net pounds.

It is important that the buyer should obtain and keep the invoice certificate connected with each fertilizer purchased, as in the event of any dispute the production of the invoice certificate is essential.

Unit Value.

Unit values represent the cost of 1 per cent. by weight of the fertilizing constituents. They are prepared by taking into account the

constituents which have a commercial value and the value of same in the simple fertilizers registered.

Simple fertilizers are those of a definite composition, and of animal origin, such as blood, and blood and bone. Nitrogen is obtainable in the form of nitrate, ammonia, blood, bone, and unspecified compounds; phosphoric acid in the form of water soluble, citrate soluble, citrate insoluble, bone, and roasted and finely-ground phosphate; potash, as chloride and sulphate.

The value of any particular brand can only be calculated from the fertilizing constituents guaranteed to be present, either on the label or on the invoice certificate. With the aid of either, and the unit value given for the respective form of the ingredient stated, the commercial value can be calculated by multiplying the percentage of the ingredient by the unit value given for same and adding together the results, as for example:—

Blood and Bone Fertilizer.

		Unit Value.	£	*s.*	*d.*
Nitrogen as blood and bone ..	5.00 per cent.	× 21s. 6d.	5	7	6
Phosphoric acid, citrate soluble	7.00 per cent.	× 5s. 6d.	1	18	6
Phosphoric acid, citrate insoluble	9.00 per cent.	× 4s. 9d.	2	2	9
Total ..	.. 16.00	Value per ton ..	£9	8	9

FERTILIZERS ACT 1915 (No. 2652).—LIST OF UNIT VALUES FOR THE YEAR 1925.

	£	*s.*	*d.*
Nitrogen, as Blood .. .. per unit	1	2	6
„ Nitrate ..			
„ Blood and Bone .. .. „	1	1	6
„ Bone and Flesh ..			
„ in Fine Bone ..			
„ Coarse Bone .. .. „	1	0	0
„ as Unspecified .. .. „	0	19	0
„ Ammonia .. .. „	0	17	0
Phosphoric Acid—			
as *Water Soluble* .. .. „	0	5	0
as *Citrate Soluble*—			
in Blood and Bone .. .. „			
Bone and Super .. .. „	0	5	6
Bone Fertilizer .. .. „			
as Fine Bone .. .. „			
in Superphosphate .. .. „			
Nitro-super .. .. „			
Basic Phosphate .. .. „	0	5	0
Market Garden .. .. „			
Complete .. .. „			
as *Citrate Insoluble*—			
in Blood and Bone .. .. „			
Bone Fertilizer .. .. „	0	4	9
as Coarse Bone .. .. „			
in Market Garden .. .. „	0	3	9
Complete .. .. „			
in Ground Phosphate .. .. „	0	2	8
as Roasted and Finely Ground .. .. „	0	5	10
in all others .. .. „	0	1	0
Potash as Sulphate .. .. „	0	5	10
„ Chloride .. .. „	0	4	10

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1925.

Description of Fertilizer.	Brand,	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Mainly Nitrogenous—		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Nitrate of Soda ..	Cresco	15·00	..	..	..	..	15·00	..	..	..	..	..	16 10 0	Cresco Fertilizers Ltd., Geelong
,, ,, ..	Federal, S.N. ..	15·50	..	..	..	..	15·50	..	..	..	..	..	16 10 0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	Sickle	15·50	..	..	..	..	15·50	..	..	..	..	..	16 10 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Mt. Lyell, M.L., in diamond	15·50	..	..	..	..	15·50	..	..	..	..	..	16 10 0	The Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	15·50	..	..	..	..	15·50	..	..	..	..	..	16 10 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Sulphate of Ammonia ..	M.G. Co., in diamond	..	20·00	..	..	..	20·00	..	..	..	..	..	17 0 0	The Metropolitan Gas Co., Flinders-street, Melbourne
,, ,, ..	Cresco	..	20·00	..	..	..	20·00	..	..	..	..	..	18 0 0	Cresco Fertilizers Ltd., Geelong
,, ,, ..	Federal, A.S.	..	20·00	..	..	..	20·00	..	..	..	..	..	17 10 0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	Sickle	..	20·00	..	..	..	20·00	..	..	..	..	..	17 10 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Mt. Lyell, M.L., in diamond	..	20·00	..	..	..	20·00	..	..	..	..	..	17 10 0	The Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourn
,, ,, ..	Wischer and Co. Pty. Ltd.	..	20·00	..	..	..	20·60	..	..	..	..	..	17 10 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Blood	Bendigo, Rohs in circle	..	..	9·50	..	..	9·50	..	..	..	..	..	13 5 0	P. Rohs Pty. Ltd., Bridge-street, Bendigo
Blood Manure	Federal	..	..	7·50	..	..	7·50	..	..	..	..	..	8 5 0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ...	Sickle	..	..	7·50	..	..	7·50	..	..	..	..	..	8 5 0	Cuming, Smith, and Co. Pty. Ltd. 65 William-street, Melbourne
,, ...	Mt. Lyell, M.L., in diamond	..	..	7·50	..	..	7·50	..	..	..	..	..	8 5 0	The Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1925—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Mainly Nitrogenous—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Blood Manure	Wischer and Co. Pty. Ltd.	..	..	7·50	..	..	7·50	..	..	..	..	..	8 5 0	Wischer and Co. Pty. Ltd., 49 Little Collins-street, Melbourne
,, ...	Cockbill's	..	..	8·53	..	..	8·50	..	..	1·00	1·00	..	8 0 0	J. Cockbill, 407 Post Office-place, Melbourne
Blood ,, ..	Imperial	..	..	10·50	..	..	10·50	..	..	..	..	..	14 0 0	W. Angliss and Co. (Aust., Pty. Ltd., 42 Bourke-street, Melbourne
Blood Manure	M.C.C., in diamond ..	..	..	8·11	..	..	8·11	..	..	1·25	1·25	0.59	6 15 0	Melbourne City Council, Town, Hall, Melbourne
,, ...	Nifex	..	..	7·50	..	..	7·50	..	..	1·00	1·00	0·25	12 0 0	H. C. Pannifex and Co., Market-street, Melbourne
,, ...	Pannifex	..	..	11·00	..	..	11·00	..	..	1·10	1·10	0·50	16 0 0	H. C. Pannifex and Co., Market-street, Melbourne
Castor Meal	Alba	..	..	..	..	..	as unspecified 5·00	..	..	..	2·00	2·00	5 10 0	Lycett Pty. Ltd., Normanby-road, Montague
Mainly Phosphatic—Readily Soluble—														
Superphosphate ..	Cockbill's	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5 5 0	J. Cockbill, 407 Post Office-place, Melbourne
,, ..	Cresco 22	..	..	..	..	..	..	21·00	0·50	1·00	22·50	..	5 5 0	Cresco Fertilizers Ltd., Geelong
,, ..	Sickle, Florida, 22 per cent.	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5 5 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ..	M.L., in diamond, high grade, 22 per cent.	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5 5 0	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Federal, S.S., Special, 22 per cent.	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5 5 0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd., Special, 22 per cent.	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5 5 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1925—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Mainly Phosphatic—continued. *Moderately Soluble.*		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Super and Phosphate ..	Federal	..	..	..	..	..	..	10·25	0·25	18·85	29·35	..	5 5 0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	M.L., in diamond ..	..	..	..	..	..	..	10·25	0·25	18·85	29·35	..	5 5 0	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	..	..	..	..	..	..	10·25	0·25	18·85	29·35	..	5 5 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
,, ,, ..	Sickle	..	..	..	..	..	..	10·25	0·25	18·85	29·35	..	5 5 0	Cuming, Smith,and Co. Pty. Ltd., 65 William-street, Melbourne
Phosphatic Guano and Super	Cresco	..	..	..	..	..	..	10·30	3·45	6·65	20·40	..	5 10 0	Cresco Fertilizers Ltd., Geelong
Super and Phosphate ..	Cresco 30	..	..	..	..	..	..	10·00	1·50	19·50	31·00	..	5 5 0	,, ,, ,,
Basic Phosphate ..	Federal B.P. ..	..	..	..	..	..	..	..	14·00	3·00	17·00	..	5 2 6	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	Sickle	..	..	..	..	..	..	..	14·00	3·00	17·00	..	5 2 6	Cuming, Smith,and Co. Pty. Ltd. 65 William-street, Melbourne
,, ,, ..	M.L., in diamond ..	..	..	..	..	..	..	..	14·00	3·00	17·00	..	5 2 6	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	..	..	..	..	..	..	..	14·00	3·00	17·00	..	5 2 6	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Difficultly Soluble.														
Ground Phosphate ..	Federal, G.P., 80 per cent.	..	..	..	..	..	..	..	..	36·65	36·65	..	4 17 6	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	Sickle, 80 per cent. ..	..	..	..	..	..	..	..	..	36·65	36·65	..	4 17 6	Cuming, Smith,and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	M.L., in diamond, 80 per cent.	..	..	..	..	..	..	..	..	36·65	36·65	..	4 17 6	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1925—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Fresh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Mainly Phosphatic—Difficulty Soluble—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Ground Phosphate ..	M.L., in diamond, 60 per cent.	..	..	..	..	..	..	..	..	27·50	27·50	..	4 5 0	The Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
" " ..	Wischer and Co. Pty. Ltd.	..	..	..	..	..	..	..	..	36·65	36·65	..	4 17 6	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Phosphatic Guano ..	Cresco	..	..	..	..	..	..	..	6·85	13·10	20·25	..	5 10 0	Cresco Fertilizers Ltd. Geelong
Phosphate (roasted and intensely ground)	Victoria	..	..	..	..	..	..	..	3·00	12·00	15·00	..	4 8 6	The Phosphate Co-op. Co. of Australia Ltd., 440 Little Collins-street, Melbourne
Phosphate (unroasted and coarsely ground)	Victoria, No. 4 ..	..	..	..	..	..	..	..	..	11·00	11·00	..	2 5 0	" " "
" "	Victoria, No. 3 ..	..	..	..	..	..	..	..	..	14·00	14·00	..	2 16 0	" " "
Containing Nitrogen and Phosphoric Acid. Readily Soluble.														
Nitro-Superphosphate ..	Federal, N.S. ..	..	1·50	..	..	0·50	2·00	15·37	1·08	1·65	18·10	..	6 15 0	West Australian Explosive Chemical Co. Ltd., 370 Little Collins-street, Melbourne
" ..	Sickle	..	1·50	..	..	0·50	2·00	15·37	1·08	1·65	18·10	..	6 15 0	Cuming, Smith, and Co Pty. Ltd., 65 William-street, Melbourne
" ..	M.L., in diamond ..	..	1·50	..	..	0·50	2·00	15·37	1·08	1·65	18·10	..	6 15 0	The Mount Lyell Mining and Railway Co. Ltd., 281 Little Collins-street, Melbourne
" ..	Wischer and Co. Pty. Ltd.	..	1·50	..	..	0·50	2·00	15·27	1·08	1·65	18·10	..	6 15 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Moderately Soluble.														
Blood, Bone, and Super..	Bendigo, Rohs in circle	..	..	..	4·00	..	4·00	5·50	6·25	2·25	14·00	..	9 17 6	P. Rohs Pty. Ltd., Bridge-street, Bendigo
" " ..	Federal, B.B.S. ..	..	..	..	2·50	..	2·50	11·28	1·67	2·35	15·30	..	7 0 0	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1925—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Containing Nitrogen and Phosphoric Acid. Moderately Soluble—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Blood, Bone and Super.	Cockbill's	..	..	..	2·50	..	2·50	11·18	2·00	5·00	18·18	..	7 5 0	J. Cockbill, 407 Post Office-place, Melbourne
,, ,, ..	Sickle	..	..	..	2·50	..	2·50	11·28	1·67	2·35	15·30	..	7 0 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	M.L., in diamond ..	..	..	..	2·50	..	2·50	11·28	1·67	2·35	15·30	..	7 0 0	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	..	..	..	2.50	..	2·50	11·28	1·67	2·35	15·30	..	7 0 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Bone and Super ..	Cresco	..	..	..	..	2·00	2·00	9·50	3·90	3·00	16·40	..	6 15 0	Cresco Fertilizers Ltd., Geelong
,, ,, ..	Federal, B.S. 1, No. 1	..	..	..	..	2·00	2·00	11·00	3·07	4·14	18·21	..	7 5 0	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	Sickle, Mixed "A" ..	..	..	..	..	2·00	2·00	11·00	3·07	4·14	18·21	..	7 5 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	M.L., in diamond, No. 1	..	..	..	..	2·00	2·00	11·00	3·07	4·14	18·21	..	7 5 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd., No. 1	..	..	..	..	2·00	2·00	11·00	3·07	4·14	18·21	..	7 5 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
,, ,, ..	Bendigo, Rohs in circle	..	..	..	..	1·50	1·50	8·50	5·25	4·25	18·00	..	9 0 0	P. Rohs Pty. Ltd., Bridge-street, Bendigo
,, ..	Gardiner's	..	..	..	..	1·39	1·39	3·20	5·80	8·00	17·00	..	7 15 0	George Gardiner and Co. Pty. Ltd., Marshall, Geelong
Super and Bone ..	Federal, S.B. ..	..	..	..	..	1·00	1·00	15·75	1·78	2·27	19·80	..	6 10 0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	Sickle, Mixed "C" ..	..	..	..	..	1·00	1·00	15·75	1·78	2·27	19·80	..	6 10 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	M.L., in diamond, No. 2	..	..	..	..	1·00	1·00	15·75	1·78	2·27	19·80	..	6 10 0	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd., No. 2	..	..	..	..	1·00	1·00	15·75	1·78	2·27	19·80	..	6 10 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1925—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Containing Nitrogen and Phosphoric Acid. Moderately Soluble—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Bone Fertilizer and Super	Elsworth's	..	..	..	..	1·50	1·50	11·00	2·50	5·00	18·50	..	6 12 6	William Roberts, "Elsworth," 128 Victoria-street, Ballarat
Slowly Soluble.														
Blood and Bone ..	W & M, in circle ..	..	..	..	6·00	..	6·00	..	4·50	5·50	10·00	..	10 0 0	Western and Murray Co-op. Bacon Coy. Ltd., 522 Flinders-lane, Melbourne
,, ,, ..	Cresco	..	..	..	6·50	..	6·50	..	8·75	5·00	13·75	..	11 10 0	Cresco Fertilizers Ltd., Geelong
,, ,, ..	Bendigo, Rohs in circle	..	..	..	6·00	..	6·00	..	3·00	6·00	9·00	..	11 0 0	P. Rohs Pty. Ltd., Bridge-street, Bendigo
,, ,, ..	Cockbill's Manure ..	..	..	..	5·50	..	5·50	..	4·00	10·00	14·00	..	10 0 0	J. Cockbill, 407 Post Office-place, Melbourne
,, ,, ..	DBC, in triangle ..	..	..	..	5·30	..	5·30	..	3·96	7·52	11·48	..	8 0 0	Gippsland Co-op. Bacon Co. Ltd., Dandenong
,, ,, ..	Gardiner's Special Magic	..	..	..	5·00	..	5·00	..	3·00	10·00	13·00	..	8 0 0	George Gardiner and Co. Pty. Ltd., Marshall Geelong
,, ,, ..	Cockbill's Fertilizers	..	..	..	5·00	..	5·00	..	4·00	12·00	16·00	..	9 0 0	J. Cockbill, 407 Post Office-place, Melbourne
,, ,, ..	Sickle	..	..	..	5·00	..	5·00	..	7·00	9·00	16·00	..	9 5 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	..	..	..	5·00	..	5·00	..	7·00	9·00	16·00	..	9 5 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
,, ,, ..	Federal, B.B. ..	..	..	..	5·00	..	5·00	..	7·00	9·00	16·00	..	9 5 0	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	M.L., in diamond ..	..	..	..	5·00	..	5·00	..	7·00	9·00	16·00	..	9 5 0	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne.
,, ,, ..	Imperial, in diamond	..	..	..	4·75	..	4·75	..	5·00	10·00	15·00	..	9 0 0	W. Angliss and Co. (Australia) Pty. Ltd., 42 Bourke-street, Melbourne
,, ,, ..	Pridham's	..	..	..	4·90	..	4·90	..	7·65	8·68	16·33	..	8 10 0	W. Pridham Pty. Ltd., Evans-street, Braybook

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1925—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potas.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Fish.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Containing Nitrogen and Phosphoric Acid. Slowly Soluble—continued.														
Bone Fertilizers ..	Sickle	..	..	..	4·00	..	4·00	1·50	5·64	7·28	14·42	..	8 7 6	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd.	..	..	..	4·00	..	4·00	1·50	5·64	7·28	14·42	..	8 7 6	Wischer and Co. Pty. Ltd., 499 Little Collins-stret, Melbourne
,, ..	M.L., in diamond ..	..	..	..	4·00	..	4·00	1·50	5·64	7·28	14·42	..	8 7 6	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Federal, B.F. ..	..	..	..	4·00	..	4·00	1·50	5·64	7·28	14·42	..	8 7 6	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ..	Ark	..	..	..	..	3·50	3·50	..	3·98	12·90	16·88	..	7 0 0	Arthur Murphy, Ararat
,, ..	Gardiner's No. 1 Magic	..	..	..	..	2·00	2·00	..	2·00	15·00	17·00	..	7 10 0	George Gardiner and Co. Pty. Ltd., Marshall, Geelong
,, ..	Samson's	..	..	..	..	2·00	2·00	..	2·00	15·00	17·00	..	7 10 0	,, ,, ,,
,, ..	A.N.A. Surprise ..	..	..	..	..	3·00	3·00	..	4·00	12·00	16·00	..	9 0 0	George William Pennell, Braybrook
,, ..	Mt. Clear	..	..	..	..	2·50	2·50	..	6·50	9·50	16·00	..	6 10 0	Bailey Bros., 155 Main-street, Ballarat East
,, ..	Elsworth's	..	..	..	..	3·00	3·00	1·50	4·00	9·50	15·00	..	7 5 0	William Roberts, "Elsworth," 128 Victoria-street, Ballarat
,, ..	Fertbone	..	..	..	4·00	..	4·00	..	2·00	8·00	10·00	..	8 17 6	H. C. Pannifex, Market-street, Melbourne
Blood and Bone ..	Pannifex, No. 1 ..	..	..	..	6·00	..	6·00	..	5·00	8·00	13·00	..	9 10 0	,, ,, ,,
,, ,, ..	Arc	..	..	..	6·00	..	6·00	..	5·00	7·00	12·00	..	9 2 6	,, ,, ,,
,, ,, ..	Pannifex, No. 2 ..	..	..	..	5·50	..	5·50	..	5·00	7·00	12·00	..	9 5 0	,, ,, ,,
,, ,, ..	H.C.P.	..	..	..	5·00	..	5·00	..	4·75	5·25	10·00	..	9 0 0	,, ,, ,,

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1925—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Mixed Manures. Containing Nitrogen Phosphoric Acid, and Potash. Moderately Soluble.														
Market Garden ..	Sickle	..	1·50	..	..	1·56	3·06	11·65	1·69	2·36	15·70	2·50	8 2 6	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ..	Federal, M.G. ..	..	1·50	..	..	1·56	3·06	11·65	1·69	2·36	15·70	2·50	8 2 6	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ..	M.L., in diamond ..	..	1·50	..	..	1·56	3·06	11·65	1·69	2·36	15·70	2·50	8 2 6	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd.	..	1·50	..	..	1·56	3·06	11·65	1·69	2·36	15·70	2·50	8 2 6	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Complete Manure ..	Wischer and Co. Pty. Ltd., No. 1	..	2·50	..	..	..	2·50	12·82	0·31	0·62	13·75	7·50	8 12 6	,, ,, ,,
,, ..	Sickle, No. 1 ..	..	2·50	..	..	..	2·50	12·82	0·31	0·62	13·75	7·50	8 12 6	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ..	M.L., in diamond, No. 1	..	2·50	..	..	..	2·50	12·82	0·31	0·62	13·75	7·50	8 12 6	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Federal, No. 1 ..	..	2·50	..	..	..	2·50	12·82	0·31	0·62	13·75	7·50	8 12 6	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ..	Sickle, No. 2 ..	..	1·00	1·00	..	..	2·00	12·30	0·30	0·60	13·20	5·00	7 10 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ..	Federal, No. 2 ..	..	1·00	1·00	..	..	2·00	12·30	0·30	0·60	13·20	5·00	7 10 0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ..	M.L., in diamond, No. 2	..	1·00	1·00	..	..	2·00	12·30	0·30	0·60	13·20	5·00	7 10 0	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd., No. 2	..	1·00	1·00	..	..	2·00	12·30	0·30	0·60	13·20	5·00	7 10 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
,, ..	Sickle, No. 3 ..	..	..	..	2·00	..	2·00	8·71	3·01	4·03	15·75	6·25	8 7 6	Cuming, Smith, and Co. Pty. Ltd. 65 William-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1925—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.			Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.		£	s.	d.	
Mixed Manures. Containing Nitrogen, Phosphoric Acid, and Potash. Moderately Soluble—continued.		%	%	%	%	%	%	%	%	%	%	%				
Complete Manure ..	Federal, No. 3 ..	..	..	..	2·00	..	2·00	8·71	3·01	4·03	15·75	6·25	8	7	6	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ..	M.L., in diamond, No. 3	..	..	..	2·00	..	2·00	8·71	3·01	4·03	15·75	6·25	8	7	6	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd., No. 3	..	..	..	2·00	..	2·00	8·71	3·01	4·03	15·75	6·25	8	7	6	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
,, ..	Cresco, Mixed ..	..	1·50	..	..	..	1·50	9·60	1·40	8·70	19·70	7·50	7	10	0	Cresco Fertilizers Ltd., Geelong
,, ..	Anglo - Continental Guano	..	4·87	..	..	..	4·87	8·85	2·39	1·37	12·61	1·89	20	0	0	Gibbs, Bright, and Co., Queen-street, Melbourne
,, ..	Dissolved Guano, A.L.	..	5·00	..	..	..	5·00	7·00	1·50	1·50	10·00	1·47	19	0	0	H. C. Pannifex and Co., 26 Market-street, Melbourne
Slowly Soluble.																
Blood, Bone, and Phosphate	Cresco, B.B., Phosphatic Guano	..	..	..	3·00	..	3·00	..	5·30	11·00	16·30	..	8	5	0	Cresco Fertilizers Ltd., Geelong
Ammonia and Phosphate	Cresco	..	2·00	..	..	..	2·00	10·00	2·00	18·00	30·00	..	·6	15	0	,, ,,
Phosphate and Potash ..	Victoria	..	..	..	..	..	..	..	4·00	9·50	13·50	5·00	8	6	0	The "Phosphate" Co-op. Co. of Australia Ltd., 440 Little Collins-street, Melbourne
Mainly Potassic. Readily Soluble.																
Sulphate of Potash ..	Cresco	..	..	..	..	..	..	..	..	..	..	48·50	15	0	0	Cresco Fertilizers Ltd., Geelong
,, ,, ..	Sickle	..	..	..	..	..	..	..	..	..	..	50·00	14	10	0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Federal	..	..	..	..	..	..	..	..	..	..	50·00	14	10	0	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	M.L., in diamond ..	..	..	..	..	..	..	..	..	..	..	50·00	14	10	0	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	..	..	..	..	.	..	..	..	..	..	50·00	14	10	0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1925—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Mixed Manures. Mainly Potassic. Readily Soluble—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Muriate of Potash ..	Cresco	..	..	..	..	..	..	..	..	..	..	50·00	12 0 0	Cresco Fertilizers Ltd., Geelong
„ „ ..	Federal	..	..	..	..	..	..	..	..	..	..	50·00	12 0 0	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
„ „ ..	Sickle	..	..	..	..	..	..	..	..	..	..	50·00	12 0 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
„ „ ..	M.L., in diamond ..	..	..	..	..	..	..	..	..	..	..	50·00	12 0 0	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
„ „ ..	Wischer and Co. Pty. Ltd.	..	..	..	..	..	..	..	..	..	..	50·00	12 0 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne

Description of Fertilizer.	Brand.	Nitrogen.	Phosphoric Acid.	Mechanical Condition.		Price asked per ton.	Where Obtainable.
				Fine Bone.	Coarse Bone.		
		%	%	%	%	£ s. d.	
Bonedust	Gardiner's Magic ..	3·00	18·00	45·00	55·00	8 0 0	George Gardiner and Co. Pty. Ltd., Marshall, Geelong
„	White Horse ..	2·50	17·00	60·00	40·00	7 0 0	Frederick Walter Richards, Warrenheip
„	Rohs, in circle, Bendigo	4·00	18·00	55·00	45·00	9 10 0	P. Rohs Pty. Ltd., Bridge-street, Bendigo
„	Mount Clear ..	3·00	18·00	30·00	70·00	7 0 0	Bailey Bros., 155 Main-street, Ballarat
„	Pannifex	4·00	20·00	20·00	80·00	9 10 0	H. C. Pannifex and Co., Market-street, Melbourne
„	Nova	3·00	18·00	30·00	70·00	8 17 6	„ „
„	Horseshoe ..	4·00	18·00	26·00	74·00	8 5 0	P. Fitzgerald and Sons, Warragul-road, Bentleigh
„	J. A. Dundas ..	4·43	21·15	35·00	65·00	9 0 0	J. A. Dundas, Dynon-road, Footscray

3rd December, 1924.

P. RANKIN SCOTT,
Chemist for Agriculture.

STALLION REGISTER, 1924-25,

Under the "Horse Breeding Act 1919."

Part I.—Registrations prior to 31st August, 1924.

Cert. No.	Name.	Age	Class.	Owner.	Address.
		Yrs.			
615	Abbey	A	Light ..	R. M. Smith ..	Landsborough
1042	Abbot's Pride ..	A	Draught ..	W. H. Gadd ..	The Glen, via Wodonga
905	,, ,, ..	A	,, ..	A. V. Baulch ..	Orford
1036	Abbotsford II. ..	6	,, ..	D. H. Adams ..	Elmore
958	Abdulla King ..	A	Pony ..	E. Stevens ..	Longwood
612	Aberdeen	A	Thoroughbred	S. W. Podger ..	Camperdown
502	Active	A	,,	G. Brown ..	Benalla
233	Admiral Howard ..	A	Draught ..	W. G. Holland ..	Warracknabeal
121	,, Speary ..	A	,, ..	C. Hill ..	Gama P.O.
646	,, Sperry ..	A	,, ..	D. Mathieson ..	Waitchie
79	,, ,, ..	A	,, ..	A. Duff ..	Baringhap
1087	,, Wood ..	A	Light ..	H. G. Hunter ..	Seymour
818	Advance	A	Draught ..	A. W. Brown ..	Speed
990	Aird Laddie ..	A	,, ..	Ed. Yeaman ..	Echuca P.B.
190	Al-Borak	A	Light ..	L. Bennett ..	Nullawil
95	Albion	A	Draught ..	J. Oakes ..	Nathalia
591	All Brown ..	4	Light ..	J. R. Laity ..	Tandarra P.O.
974	,, Green	A	Thoroughbred	R. Biggar ..	Waaia
49	,, Style	A	Light ..	R. Matchett ..	Adelaide Hill T.S.F., Bendigo
694	Allandale	3	Draught ..	W. Byron ..	Beulah
647	Almont, M. ..	A	Light ..	J. Minns ..	Melton
973	,, Rose ..	A	,, ..	J. Rilen ..	South Muckleford
790	Ambershine ..	A	,, ..	L. A. Gunsser ..	37 Marshall-st., Newmarket, Victoria
80	Amberstain ..	A	,, ..	J. L. Cumming ..	Berrimal, via Wedderburn
625	Angle Jack ..	A	,, ..	C. T. Hillas ..	Double Gully, Tallangatta
81	Applause	A	Pony ..	T. Ridgway ..	Clyde
1091	Ardmore	4	Draught ..	J. B. Howe ..	Memsie, Bridgewater
501	Argyle	A	,, ..	F. McRae ..	Wallup
649	,, ...	A	Pony ..	R. Trimble ..	Rutherglen
1104	Ash Voyage ..	5	Light ..	J. Guthrie ..	Broken River, Shepparton
122	Assembler ..	A	Pony ..	J. Ferguson ..	5 Peel-street Sth., Ballarat East
123	Athlete	A	,, ..	J. Lane ..	Club Hotel, Warragul
381	Attraction's Champion	A	Draught ..	W. Morley ..	Red Hill, Rutherglen
1135	Austral Song ..	A	Light ..	P. Burke ..	Tatura
1095	Avon Dale ..	3	Draught ..	A. J. McDougall	Katandra, via Cosgrove
500	,, Lea ..	A	,, ..	J. Leitch ..	Wodonga W.

STALLION REGISTER, 1924–25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address
		Yrs.			
218	Axedale Prince ..	A	Draught ..	J. McDonald ..	Ultima
831	Aztic	6	Light ..	J. R. Regner ..	Panitya East
1224	Bally Boy ..	3	Pony ..	Rumpf ..	Herne Hill
702	Ballyloo	3	,, ..	L. Strickland ..	Kanya P.O.
909	Banderlad ..	5	Thoroughbred	H. L. Stanislaus	Walpeup
1019	Bando	A	Draught ..	Sharp & Taylor..	City-road, Sth Melbourne
362	Banjo	6	Pony ..	R. Jukes ..	Maryborough
152	Bannockburn ..	A	Draught ..	G. W. Francis ..	Lower Norton
648	Baritone	6	,, ..	R. Humphrey ..	Cudgewa
382	Barney II. ..	A	Pony ..	A. W. Thomson	Hamilton
650	Baron	A	Draught ..	D. Butler ..	Sheep Hills
499	,, ...	6	,, ..	Maguire ..	Barwidgee Settlement
322	,, Alexander ..	A	,, ..	A. F. Russell, exrs. of J. K. Russell	Barunah Plains, Hesse
1223	,, Barunah ..	3	,, ..	,, ,,	,, ,,
1221	,, Bellum ..	2	,, ..	Coy & Coy, F. C.	Salt Creek, Woorndoo
1075	,, Boy ..	3	,, ..	McCrabb Bros. ..	Wunghnu
706	,, Brilliant ..	3	,, ..	M. P. Murphy ..	Rupanyup
921	,, Carlyle ..	4	,, ..	P. Bagnell ..	Mologa
1057	,, Cedric ..	3	,, ..	G. Lukie ..	Springhurst
1186	,, Charm ..	3	,, ..	J. Clifford ..	Purnim
465	,, Clover ..	4	,, ..	J. Lord ..	Boigbeat
293	,, Clyde ..	A	,, ..	Cunnington Bros.	Bamawm
864	,, Crombie ..	2	,, ..	A. Colvin ..	Nathalia
153	,, ,, ..	A	,, ..	A. P. Johnston ..	Corop
907	,, Dale ..	2	,, ..	Hewitt & Sons ..	Werrigar East
654	,, David ..	6	,, ..	G. Stokes ..	c/o Adamson, Strettle & Co.
1116	,, Douglas ..	A	,, ..	J. Petrie ..	St. Arnaud N.
1119	,, Duke ..	5	,, ..	A. Colvin ..	Nathalia
154	,, Faithful ..	A	,, ..	D. Barry, Junr.	Culgoa
1105	,, Fashion ..	5	,, ..	J. Burns ..	Delaforce, Euroa
68	,, Fenwick ..	A	,, ..	H. C. Wilson ..	Raywood
885	,, Hope ..	3	,, ..	A. Colvin ..	Nathalia
354	,, Jock ..	6	,, ..	M. Lynch ..	Hopetoun
353	,, Juno ..	A	,, ..	T. Wallbridge, Pty. Ltd.	365 Flinders-st., Melbourne
1150	,, Laddie ..	A	,, ..	A. McLennan ..	Derrinal
1082	,, Lee ..	A	,, ..	Khan Meer ..	Modewarre
1076	,, Mac ..	3	,, ..	McCrabb Bros. ..	Wunghnu
1182	,, May ..	A	,, ..	H. W. Oberin ..	Goornong
352	,, McKie ..	A	,, ..	J. A. McDougall	Katandra
292	,, McLeod ..	A	,, ..	David Mitchell Estate	Lilydale
858	,, Major ..	4	,, ..	Krelle & Henke..	Minyip
1151	,, Minto ..	A	,, ..	Executors W. Hermiston	Mansfield
593	,, Newton ..	3	,, ..	L. W. Crapper ..	Neilborough
240	,, of Dalmore ..	A	,, ..	J. R. Henty ..	Pakenham Park, Pakenham
592	,, Regulus ..	3	,, ..	J. A. Dolman ..	Neilborough
1070	,, Rosebery ..	A	,, ..	W. Allen ..	Lara, Bagshot
297	,, Silk ..	6	,, ..	K. Cameron ..	Warracknabeal

STALLION REGISTER, 1924-25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
192	Baron Stanley ..	A	Draught ..	P. F. Cantwell ..	Tooronga, Mt. Egerton
174	,, Stewart ..	A	,, ..	H. L. Adams ..	Yielima P.O.
34	,, Style ..	6	,, ..	A. J. A. Browne	Werribee
1013	,, Vale ..	4	,, ..	W. J. Hocking ..	Oakvale
1228	,, Watson ..	A	,, ..	J. M. Fahey ..	Camperdown
351	,, Wattie ..	A	,, ..	F. Nagorcka ..	Farrington
19	,, Weerite ..	A	,, ..	Manifold & Co. ..	Purrumbete, Weerite
1238	Baron's Chief ..	4	,, ..	G. & W. Lord ..	Flynn
1097	,, ,, ..	2	,, ..	T. Shanahan ..	Korobeit
241	,, Favourite ..	6	,, ..	D. L. Bodey ..	Jung
576	,, Hero ..	3	,, ..	W. H. Allen ..	Broughton
175	,, Idol ..	A	,, ..	J. Carmichael, jun.	Mulwala P.O., N.S.W.
350	,, Pride ..	A	,, ..	H. Scarse ..	Melton
1197	,, ,, ..	2	,, ..	G. Crabb ..	Yeo
1173	,, ,, ..	6	,, ..	J. J. Quinn ..	Elmore
865	,, Prince ..	5	,,	M. Rasheed ..	Adelaide, S.A.
498	,, Reserve ..	A	,, ..	E. J. McCabe ..	Gerang Gerung
497	,, Royal Chief	A	,, ..	T. E. Parry ..	Coonooer Bridge
60	,, Superior ..	A	,, ..	W. Bransgrove ..	Neerim North
768	Barony	A	,, ..	R. A. Martin ..	Navarre
999	Basella	A	Thoroughbred	R. O'Halloran ..	Granya
639	Basil B.	A	Light ..	W. A. Riedell ..	Tongala
291	Battarlons ..	A	,, ..	T. Skelly, jun. ..	St. Arnaud
242	Bawnmoor ..	A	Thoroughbred	Jessa Singh ..	Nyarrin
959	Bay Harold ..	A	Light ..	A. Sutherland ..	10 Palmer-st., Oakleigh
791	Beaconsfield Flyer ..	A	,, ..	A. E. Harding ..	Milawa
363	Beau Gallant ..	A	,, ..	T. Dunlop ..	Birregurra
642	Bell Boy	A	Pony ..	T. Bandy ..	Waubra
243	,, ,, ...	A	Light ..	A. G. Turnbull ..	Winniburn Nth
713	,, ,, ...	4	Pony ..	F. R. Lovell ..	Ararat P.B.
683	,, ,, Voyage ..	A	Light ..	P. Sullivan ..	210 Arden-st., North Melbourne
459	,, Bronze ..	4	,, ..	M. D. Lechane ..	Charlton
972	Belmont Again ..	A	Draught ..	W. A. Creighton	Alexandra
413	,, Chimes ..	A	Light ..	C. S. Walker ..	Warwick Stud Farm, Swan Hill
301	,, Print ..	3	Draught ..	J. A. Tweddle ..	Waaia
349	Belmont's Champion	A	,, ..	H. Scarse ..	Melton
273	Ben Model ..	6	,, ..	H. Adams ..	Yaapeet
928	Berkley Bantam ..	A	Pony ..	R. Crozier ..	South Morang
236	Berra Bach ..	A	,, ..	Timmins & Watson	Marnoo
844	Berwick Victor ..	3	Draught ..	Mitchell & O'Brien	c/o Campbell & Sons, Bourke-st., Melbourne
348	Best Vale	A	Light ..	E. H. Guppy ..	Goomalibee L.B.
1049	Bill Orange ..	4	Thoroughbred	W. J. Everett ..	Tongala
1114	Bingen	A	Light ..	Watts Bros. ..	Kamarooka
619	Birdwood	A	,, ..	W. A. Riedell ..	Tongala

STALLION REGISTER, 1924–25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
769	Bismacrk	A	Light ..	H. J. Manthorpe	Inglewood
1128	Black Bolt ..	A	Pony ..	G. Meek ..	Kinimakatka
820	Blackboy	A	Light ..	T. Blackie ..	Sale
479	Black Diamond ..	5	Draught ..	H. Neutha ..	Rockbank P.O.
817	,, Knight ..	6	Light ..	G. & W. Lord ..	Flynn
111	,, Prince ..	A	Pony ..	T. Goudie ..	Thoona
644	,, Rock ..	A	,, ..	A. Shanks ..	Tooloy Bag, Lake Mundi
411	,, Shepherd ..	6	Draught ..	Simpson Bros. ..	Yambrina P.O.
1218	,, Steel ..	A	Thoroughbred	J. K. Shepherd ..	Ouyen
645	,, Tom ..	A	Light ..	A. Potter ..	Naroghid
594	,, Voyage ..	5	,, ..	J. Penno ..	Marong
290	Blair's Choice ..	6	Draught ..	W. M. R. Keam	Glenlea, via Gerang
941	,, Pride ..	2	,, ..	T. A. Palm ..	Lorquon
69	Blue Bolt ..	6	Pony ..	A. Philip ..	Nerrin Nerrin
816	,, Ribbon ..	A	Draught ..	D. McGrath ..	Manangatang
1204	,, Wilkes ..	A	Light ..	A. E. Kay ..	Dean
472	Bob Royal ..	3	Draught ..	W. S. Robins ..	Yatpool
668	Bobbie	6	Pony ..	E. Barratt ..	Traynor's Lagoon
720	,, Dillon ..	3	Light ..	W. R. Williams	Castlemaine
62	Bobby	A	Pony ..	G. Officer ..	Woolthorpe
217	Bobniak	A	Light ..	H. F. Clarke ..	Miepoll
82	Bold Action ..	A	Draught ..	L. Culloden ..	Jung
1184	,, Agitation ..	A	,, ..	Chamberlain & Ritchie	Morwell
866	,, Alba ..	2	,, ..	M. Rasheed ..	Adelaide, S.A.
449	,, Arthur ..	5	,, ..	J. Galloway ..	Majorca
1257	,, Baron ..	A	,, ..	R. L. Pearse ..	Kewell North
940	,, Briton ..	A	,, ..	C. A. Schulz ..	Lake Hindmarsh
548	,, Captain ..	5	,, ..	T. Parker ..	Pepper Plains
373	,, Craig ..	3	,, ..	J. A. Collins ..	Fenton's Creek
1219	,, Everard ..	3	,, ..	A. E. Capron ..	Lethbridge
981	,, Lad ..	A	Pony ..	J. W. Smith ..	Elmore
496	,, MacGregor ..	A	Draught ..	W. McNaughton	Walpeup
946	,, Newton ..	A	,, ..	J. R. Mitchell ..	Sandford
329	,, Prince ..	6	,, ..	F. C. Thomas ..	Blackheath
560	,, Scott ..	3	,, ..	S. H. Bleakley ..	Horsham
679	,, Silk	2	,, ..	J. H. Meyer ..	Kaniva ..
792	Bolwalla	A	Thoroughbred	Harris & Dunne	Warrnambool
216	Bon Wickliffe ..	A	Light ..	J. Ford ..	Wickliffe
1190	Bonnie	4	Pony ..	F. H. Osborne ..	Cudgee
1010	,, Abbott ..	5	Draught ..	W. G. Wilkinson	Yarrawonga
1113	,, Belmont ..	A	,, ..	J. T. Watkins ..	Euroa
1112	,, Churchill ..	2	,, ..	R. Rowe ..	Pine Lodge Railway Station
561	,, Craig ..	2	,, ..	F. C. Thomas ..	Blackheath
632	,, Culloden ..	3	Light ..	Mrs. C. E. Disher	Yaapeet
484	,, Direct ..	A	,, ..	W. T. Taylor ..	Merbein South
589	,, Dundee ..	3	Draught ..	J. Spedding ..	Woodstock W.
1094	,, Salisbury ..	4	,, ..	C. H. Feldtman	Major Plains, via Goorambat

STALLION REGISTER, 1924–25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
35	Bonnie Scotchman	A	Draught ..	R. Price ..	State School, Loose Bag, Wallacedale South
845	,, Threave ..	3	,, ..	Mitchell & O'Brien	c/o Campbell & Sons, Bourke-st., Melbourne
893	,, Viceroy ..	3	,, ..	J. Bunge & Sons	Sheep Hills
1043	,, Voyage ..	A	Light ..	Busst & Glasheen	Huntly P.O.
112	,, Wizard ..	A	Pony ..	J. J. Cox ..	Nathalia
908	Bonny Douglas ..	2	Draught ..	Hewitt & Sons ..	Werrigar East
1178	,, Mac ..	4	,, ..	J. Brown ..	Stawell
680	,, Stewart ..	3	,, ..	J. H. Meyer ..	Kaniva
1175	Border Prince ..	4	,, ..	H. S. R. West ..	Corop
159	Bower Bank ..	A	Light ..	J. O'Bree ..	Piangil
1050	Boy Ribbon ..	3	,, ..	E. M. Stayte ..	Box 21, Tongala
846	Brae Laddie ..	3	Draught ..	R. Landale ..	Deniliquin, N.S.W.
669	Bramhope Forester	A	,, ..	A. E. Hill ..	Jacka Jacka, Tooan
553	,, Kelm ..	4	,, ..	G. Hicks ..	Miram
364	,, Monarch	A	,, ..	,, ..	,,
113	,, Paladin	A	,, ..	W. H. Alford ..	Modewarre P.O.
219	Brassey's Pride ..	A	Pony ..	A. E. Millar ..	Hopevale
88	Breastknot ..	A	Draught ..	W. J. Moll ..	Dimboola
124	Brecknock ..	A	Pony ..	R. Hentschel ..	Bonnie Doon
412	Brigham	4	,, ..	J. E. Edwards ..	Tottington, St. Arnaud
1027	,, Again ..	A	,, ..	A. Webster ..	Camperdown
414	,, ,, ..	A	,, ..	J. Burns ..	Delaforce, Euroa
1156	,, Shanter ..	A	,, ..	J. J. Wall ..	Numurkah
36	Brigham's Last ..	A	,, ..	P. E. Baulch ..	Orford, via Port Fairy
1191	,, Pride ..	3	,, ..	W. Rogers ..	Russell's Creek
1106	Bright Treasure ..	3	Draught ..	M. Thompson ..	Yalca
971	British Admiral ..	A	,, ..	W. Sheehan ..	South Muckleford
244	Briton's Pride ..	A	,, ..	A. Cameron ..	Balmoral
483	Bronte's Pride ..	A	Pony ..	J. V. Hosking ..	Towaninnie
1009	Brown Brilliant ..	4	Draught ..	J. T. Bartlett ..	Barnawartha
1192	,, Lock ..	2	Pony ..	W. Henderson ..	Grassmere
521	Buchlyvie's Choice ..	A	Draught ..	W. J. Westendorf	Dimboola
347	Bundoran ..	A	Light ..	A. Graham ..	Bacchus Marsh
1056	Bungoona ..	A	,, ..	R. E. Huon ..	Rochester P.O.
415	Bushlark	A	,, ..	W. H. Penaluna	Boolarra
184	Bute Laddie ..	A	Draught ..	Crawford Bros. ..	Tatura
1060	Button Band ..	A	Light ..	W. G. Butler ..	Verdon-street, Inglewood
970	Cacique	A	Thoroughbred	J. H. Templer ..	Winian East
63	Calais	A	Light ..	G. Officer ..	Woolsthorpe
552	Calamus	A	Thoroughbred	T. N. Skinner ..	Bordertown, S.A.
408	Caledonia	A	Draught ..	Withers Bros. ..	Bobinawarrah
1069	Calland Dale ..	A	,, ..	J. E. Hooper ..	Devenish

STALLION REGISTER, 1924-25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1181	Camperdown ..	A	Pony ..	C. Mayne ..	Darebin-street, Northcote
643	Canary II. ..	6	,, ..	G. T. Barber ..	Leonard's Hill
789	Canary's Pride ..	A	,, ..	W. Nichols ..	Speed
54	Canny	A	Thoroughbred	T. A. Griffiths ..	Glenrowan
235	Captain Douglas ..	5	Draught ..	C. S. Rodda ..	P. B., Warracknabeal
1079	,, White ..	A	Thoroughbred	R. Gilder ..	Glenmaggie
120	Carman	A	Light ..	W. Lane ..	Lucknow
125	Carmichael ..	A	Draught ..	J. A. Pearse ..	Glenrowan W.
5	Carmyle	3	,, ..	M. McKinnon ..	Beazley's Bridge
623	Carovita	A	Pony ..	W. F. Clarke ..	Heyfield
888	Cascadian ..	6	Draught ..	J. Cumming ..	Flora Hill, Bendigo
1236	Castledale ..	3	,, ..	J. B. Ferguson ..	Waubra
963	Cedric	A	,, ..	S. L. Moodie ..	Gatum, via Hamilton
452	,, Dale ..	5	,, ..	P. O. W. Thomas	Walpeup
1047	,, Hero ..	6	,, ..	Hardetta Singh	Pier Millan P.O.
183	Cedric's Son ..	A	,, ..	S. Barber ..	Birchip
1188	Centredale ..	4	,, ..	J. Opie ..	Werribee
819	Centrewood ..	A	,, ..	C. E. Young ..	Main-st., Mornington
519	Chal	A	Thoroughbred	W. T. Connor ..	Londrigan
1148	Champion of Kelmscott	A	Draught ..	W. H. Robinson	P.B., Budgerum Route, via Kerang
161	Cherry Farm Standard	6	,, ..	Dyke Bros. ..	Gre Gre Village
1155	Cherry Vale ..	A	Thoroughbred	J. Wright ..	Beech Forest
385	Cheviot	A	Light ..	M. Zimmer ..	Epping
148	Cicero	A	Draught ..	R. Lloyd ..	Kyabram
634	Clair's Pride ..	4	,, ..	T. J. Dean ..	Landsborough
896	Clan Campbell ..	2	,, ..	G. Newitt ..	Sheep Hills
214	,, Fingon ..	A	Thoroughbred	Ned's Corner Coy.	Mildura
245	,, Newton ..	A	Draught ..	E. V. Colson ..	South Wangaratta
628	Claredon	A	Pony ..	Bennett Bros. ..	Coleraine
969	Clarendon 2nd ..	A	,, ..	C. Underwood ..	Timboon
96	Clarey	A	,, ..	J. Jones ..	Yarroweyah North
832	Clarion	A	,, ..	W. H. Thompson	Yalca
215	Claymore	A	,, ..	J. P. Hanrahan	Ballan
475	,, Junior ..	4	,, ..	,, .. ,, ..	,,
1015	Claymore's Pride ..	3	,, ..	E. Bromley ..	Tungamah
912	Clem	A	,, ..	M. Skeyhill ..	Weerite
1132	Cleve Todd ..	6	Light ..	T. A. Hardwick	Queen-street, Nth Essendon
83	Clyde Boy ..	A	Draught ..	H. Goldsmith ..	Corack
176	,, Laddie ..	A	,, ..	J. Alexander ..	Caniambo
847	Clydesdale President	A	,, ..	L. J. King ..	Quambatook
867	Clydeside	2	,, ..	G. W. Burrows ..	Scottsdale, Tasmania
155	Cock Robin ..	A	,, ..	W. P. Marshall ..	Glenmaggie
906	,, ,, ..	A	,, ..	T. G. Warren ..	Orbost
114	Coliban	A	,, ..	W. Todd	Taradale

STALLION REGISTER, 1924-25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
126	Colonel Dale ..	A	Draught ..	T. F. Major ..	McMillan's P.O.
237	,, Garfield ..	A	,, ..	Millard Bros. ..	Dean's Marsh P.O.
144	Comedy Star ..	6	Thoroughbred	T. Pearce ..	Flowerdale Estate, Broadford
1244	Comet	3	Draught ..	W. Henderson ..	Grassmere
20	Commodore Nut ..	A	Pony ..	Manifold & Co. ..	Purrumbete, Weerite
1048	,, III. ..	6	,, ..	E. C. Weir ..	Sale
346	Commonweal ..	A	Draught ..	W. C. Holt ..	Foster
934	Commonwealth ..	A	Light ..	S. Mathieson ..	St. Helen's Plains
6	Conqueror.. ..	5	Draught ..	M. McKinnon ..	Beasley's Bridge
653	Contractor ..	A	Light ..	J. T. Ovens ..	Cooma, via Byrneside
848	Coral Premier ..	3	Draught ..	Mitchell & O'Brien	c/o Campbell & Sons, Melb.
1124	Cornet	4	Pony ..	W. Coxon ..	Nangella
1085	Coronation Day ..	A	,, ..	J. O'Brien ..	Hamilton
718	Corporal Kelvin ..	3	Draught ..	J. E. L. Pieper ..	Yeoburn, via Kerang
892	Corrong Chief ..	2	,, ..	T. Robins ..	Hopetoun
913	Cosmopolitan 2nd ..	A	Light ..	E. Heath ..	Lal Lal
246	Count Bingen ..	6	,, ..	M. G. Porker ..	Pepper's Plains
627	,, Rhymney ..	A	Pony ..	Bourke Bros. ..	Monomeith
1068	,, Traquair ..	A	Thoroughbred	T. D. Ryan ..	Tatura
1064	Craig Avon ..	2	Draught ..	Wm. Walter ..	,,
959	,, Derby ..	3	,, ..	A. R. Allan ..	Broughton, via Nhill
1065	,, Eran ..	4	,, ..	Wm. Walter ..	Tatura
1237	,, Lion.. ..	2	,, ..	J. D. Rathjen ..	Flynn
270	Craigie Masterstroke	A	,, ..	F. Falkiner & Sons Ltd.	Boonoke North, Widgiewa Siding, N.S.W.
894	Craigieburn Member	3	,, ..	A. Cameron ..	Box 99, Warracknabeal
578	Craigieburn's Pride	3	,, ..	W. H. Allan ..	Broughton, via Nhill
1141	Craigielea of Aberdour	4	,, ..	R. Stewart ..	Tolmie P.O.
582	Craigieright ..	3	,, ..	A. C. Jorgenson	Katyil
868	Craigmond ..	5	,, ..	G. Burrows ..	Tasmania
37	Crest of the Wave ..	A	Thoroughbred	F. Hender ..	Franklinford
383	Crighton's Tim ..	6	Pony ..	S. A. Greaves ..	Narre Warren
849	Crofthead Douglas ..	3	Draught ..	H. Davis ..	Curlewis
1111	Cronje Wilkes ..	A	Light ..	G. B. Mackie ..	Camperdown
1174	Crown Jewell ..	A	Draught ..	Kuhne Bros. ..	Wheatlands, via Rainbow
1126	,, Steel ..	A	Thoroughbred	H. Young ..	Nhill
556	Culcoon	4	Light ..	Mrs. M. Spargo ..	Nypo, via Yaapeet
384	Culloden	A	,, ..	A. Millard ..	Yaapeet
416	Cymbrel	6	,, ..	S. Hancock ..	Poowong
3	Cymro Bach ..	A	Pony ..	C. B. McKenzie	Llanos, Yarram
637	,, Bar ..	A	,, ..	A. Dunn ..	Trawalla

STALLION REGISTER, 1924-25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
518	Cyndett II. ..	A	Pony ..	G. J. Marshall ..	141 Stawell-st., Burnley
942	Cyndette II. ..	A	,, ..	M. Rule ..	Red Bank, Stratford
447	Dalbora's Pride ..	3	Draught ..	W. Bunworth ..	Watchupga
375	Dalcampbell Cleve ..	A	Light ..	C. E. Baker ..	100 Tinning-st., W. Brunswick
1120	Dalcrombie ..	3	Draught ..	J. Rumbold ..	Laanecoorie
770	Dalmeny	A	,, ..	A. Robertson ..	Doroq
115	Dalmore	A	,, ..	H. Wood ..	Bangerang
1118	Dalmore's Choice ..	3	,, ..	A. G. Turnbull ..	Winnieburn N., Coleraine
1194	Dalmore's Keynote	3	,, ..	P. Rentsch ..	Croxton East
469	,, King ..	4	,, ..	R. Hodgson ..	Jeffcott North
287	,, Pride ..	6	,, ..	R. G. Keynam ..	Patchewallock
137	Dalyston	A	Light ..	J. O'Brien ..	Koroit
345	Dan Again ..	A	Draught ..	C. I. Dunster ..	Willaura
968	,, Patch Junior ..	A	Light ..	J. McCormick ..	Knowsley P.O.
386	Dancing Bell ..	A	,, ..	W. C. Marshall ..	Beremboke
72	Dandenong ..	6	Pony ..	R. C. Ladlow ..	Horsham
162	Dandy	A	,, ..	P. Purves ..	Green Hills, Rosebud
387	,, ...	A	,, ..	F. Bell ..	Stony Creek
936	,, Again ..	A	,, ..	A. Polack ..	Katyil
636	,, ,, ..	A	,, ..	R. Lawler ..	Ouyen
577	,, Direct ..	6	Light ..	Wilkinson & Graves	Manangatang
177	,, Duke ..	A	Pony ..	Kong Meng Bros.	Longwood
771	,, Jim ..	A	,, ..	E. McDonald ..	Tangambalanga
815	,, Lad ..	A	,, ..	Stuckey Bros. ..	Flynn's Creek
772	,, ,, ..	A	,, ..	A. C. Head ..	Seymour
417	,, Nut ..	A	,, ..	E. S. Small ..	San Remo
1167	,, O. ..	3	,, ..	J. Forsyth ..	Murrayville
97	,, Premier ..	5	Draught ..	R. W. Zirkler ..	Kerang
838	,, Style ..	A	Pony ..	S. R. Lobb ..	Nagambie
674	Dandy's Pride ..	A	,, ..	A. W. Bartel ..	Baranduda
231	Danedite	A	Draught ..	P. Gardiner ..	The Lake, Carlisle River
103	Darling's Comet ..	A	,, ..	Brock Bros. ..	Moe
1110	Deck Top ..	A	Light ..	Mackin Bros. ..	Korong Vale
38	Decorator ..	A	Pony ..	F. E. Jennings ..	Inglewood
1129	Desert Star ..	A	,, ..	A. Mann ..	Walwa
25	Dhobi	A	Light ..	H. Aldous ..	Molesworth
61	Dibdale	A	Thoroughbred	G. Officer ..	Woolsthorpe
409	Dick Alto ..	A	Light ..	W. Newhound ..	Barnawartha
517	Digger	A	,, ..	R. Dunbar ..	Harston, via Byrneside
633	Digit Alto ..	A	,, ..	D. Cuthbert ..	Weerite
525	Dillon Bell ..	A	,, ..	S. J. Lewis ..	Baringhup
50	Direct Argot ..	A	,, ..	R. Matchett ..	Adelaide Hill Stud Farm, Bendigo
707	,, Kola ..	5	,, ..	J. A. Wilson ..	Pira, via Swan Hill
1017	,, Speed ..	A	,, ..	W. T. Butcher ..	Drysdale
803	,, Wilkes ..	A	,, ..	E. Scown ..	Terang
1063	Director	5	,, ..	J. Jeffrey ..	Echuca

STALLION REGISTER, 1924-25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
212	Director	A	Light ..	H. T. Lummis ..	Murphy's Creek
51	Directway ..	A	,, ..	R. Matchett ..	Adelaide Hill Stud Farm, Bendigo
308	Dixie Boodle ..	A	,, ..	J. D. Yourn ..	Chiltern Valley
178	,, Wood ..	6	,, ..	F. W. Shillito ..	Yendon
1021	Domination ..	A	Pony ..	C. T. Lucas ..	Pomborneit
247	Don Alto	A	Light ..	G. Maxwell ..	Wangaratta
821	,, Huon ..	A	Pony ..	W. Lyons ..	Drouin P.O.
956	,, Olive ..	A	,, ..	A. Cheesley ..	Barnawartha
631	,, Tourie ..	A	Light ..	J. Dillon ..	Manangatang
116	Donald	A	Pony ..	W. E. Attiwill ..	Hexham
98	Donald's Best ..	A	Draught ..	D. Kelly ..	Kunat
773	Donibristle ..	A	,, ..	Wilson Estate ..	Home Station, Milawa
117	Dorregal Chief ..	A	,, ..	P. R. Olson ..	Jeparit
850	Douglas Acme ..	3	,, ..	P. O'Callaghan ..	Jack River
516	,, Chief ..	5	,, ..	W. J. Byrne ..	Beulah
75	,, Chief ..	A	,, ..	W. G. Sallman ..	Dimboola
562	,, Fairbanks	3	,, ..	A. B. Dufty ..	Lorquon
603	,, Prince ..	4	,, ..	E. W. Harders ..	Box 61, Dimboola
563	Dreadnot	4	,, ..	E. Lawes ..	Greenland Dam L.B., via Horsham
248	Druce	A	Light ..	J. Holt ..	Cochrane's Creek
193	Drum Laddie ..	A	Draught ..	R. S. Brunt ..	Kyabram
863	Drumcross Radiance	A	,, ..	W. M. Black ..	Coldstream
1158	Drummond King ..	A	,, ..	W. Watts ..	Kamarooka
39	Drumore	A	Thoroughbred	J. McPhee ..	Merino
697	Drumry Equipment	A	Draught ..	J. Maher ..	Tatura
490	Drysdale	A	,, ..	D. Crozier ..	South Morang
774	Duddon	A	Thoroughbred	E. W. Dixon ..	Cowes, Philip Is.
163	Duke	A	Draught ..	E. A. Thornley ..	Hawkesdale
814	,, Little Eyes ..	A	,, ..	A. E. Bowman ..	Tallangatta
1006	,, of Winton ..	5	Light ..	W. C. Bain ..	North Winton
929	Duncan Stewart ..	A	Draught ..	J. Fitzpatrick ..	Heyfield
509	Dundonald ..	A	,, ..	J. Adams ..	Box 16, Swan Hill
468	,, ..	3	,, ..	S. Hepworth ..	P.B., Donald
670	Dundonald's Chief ..	A	,, ..	H. Doherty ..	St. James, Vic.
673	Dunsby's Pride ..	A	,, ..	J. R. Baldwin ..	Gre Gre Village
282	Dunure Blend ..	6	,, ..	Hehr Bros. ..	Woolert
44	Dux Picture ..	A	Light ..	H. A. Kent ..	41 Greig-street, South Melbourne
564	Earl Northcote ..	3	Draught ..	F. O'Byrne ..	c/o Young Bros., Horsham
1004	Earl of Claymore ..	3	,, ..	J. Hiskens ..	Rutherglen
105	Earlsan	A	Thoroughbred	W. McInnes ..	Macalister-st., Sale
127	Eastern Star ..	A	Draught ..	L. G. McLean ..	Boolite
793	Eaton Headlight ..	6	,, ..	E. W. Schneider	Yulecart
1143	Eaton's Pride ..	4	,, ..	G. Grey ..	Branxholme
305	Echelon	A	Light ..	H. T. Nicholas ..	Breffni
451	Eclypse	3	Draught ..	A. McKinnon ..	Walpeup

STALLION REGISTER, 1924–25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
344	Electioneer ..	A	Light ..	G. J. Shaw ..	Box 31, Yarram
118	Emerson	6	Thoroughbred	A. S. Blair ..	Box 30, Watchem
630	Emulator's Pride ..	A	Light ..	W. McArthur ..	Noorat
249	Erigator	A	Draught ..	R. Whinfield ..	Bamawm
454	Estell Junior ..	5	Light ..	D. Green, jun. ..	Nullawil
1093	Ettrick Dale ..	4	Draught ..	M. Crawford ..	Strathmerton
1089	Everard Bute ..	5	,, ..	J. G. Bail ..	Kyabram
343	Excel	A	Pony ..	W. C. Holt ..	Foster
1008	Fabrikoff's Heir ..	4	Draught ..	W. Cheesley ..	Barnawartha
1165	Factotum ..	5	,, ..	G. Buckley ..	Wickliffe
530	Fairhaven ..	A	,, ..	P. Smith ..	Skipton
1011	Famous Voyage ..	3	Light ..	M. McCallum ..	Yarrawonga
1206	Farr	5	Thoroughbred	G. J. O'Dwyer ..	Mordialloc
99	Fashion Direct ..	A	Light ..	R. W. Zirkler ..	Kerang
629	Fashion's Model ..	A	Draught ..	A. B. Hamilton	Fish Creek
366	Fast Time	A	Pony ..	J. Nevett ..	Toolamba
388	Fatty Arbuckle ..	A	Draught ..	E. S. Argent ..	P.B., Warracknabeal
851	Favourite Bold ..	3	,, ..	A. C. Jeffrey ..	Tallygaroopna West
775	Federal Duke ..	A	,, ..	J. Hendry ..	Bridgewater-on-Loddon
617	,, Prince ..	A	,, ..	G. M. Vallence ..	Cohuna
268	,, Sail ..	6	,, ..	J. D. Rhodes ..	Daysdale, N.S.W.
230	Federation ..	A	Pony ..	A. Cannon ..	Irriwillipe East
191	Fidelio	A	Thoroughbred	F. H. Smith ..	Lalbert
309	Finnimore ..	A	,,	J. Brown ..	Natimuk
342	Firebrick	A	Light ..	P. Higgins ..	Cowwar
1044	First Grattan ..	A	,, ..	J. J. Chisholm ..	Cranbourne-rd., Dandenong
1084	,, Voyage ..	A	,, ..	W. J. Minns ..	Melton
555	Fitzallan's Model ..	4	Draught ..	A. E. Male ..	Yaapeet
919	Flash Dale ..	4	,, ..	T. Bagnell ..	Yarravilla
1160	,, Dillon ..	A	Light ..	R. E. Monk ..	Mooroodue
842	,, Donald ..	A	,, ..	H. W. Edgar ..	Woomelang
213	,, Jack ..	A	Draught ..	P. McIntyre ..	P.B., Warracknabeal
903	,, Stephen ..	2	,, ..	A. Arnold ..	Werrigar East
1217	Flashwood ..	A	Light ..	R. Elvis ..	Kooweingaboora
652	Flying Star ..	A	,, ..	O. Martin ..	Leongatha
418	Foreigner ..	A	Pony ..	C. Ferrari ..	Devondale
1022	,, II. ..	A	,, ..	H. Scott ..	Lillimur
1164	Forrest King ..	4	Draught ..	G. Meek ..	Kinimakatka
250	Free Scot ..	A	Light ..	T. Robertson ..	Moyne Falls, Macarthur
932	Freedom	A	,, ..	N. Robertson ..	c/o Vine Hotel, North Wangaratta
389	,, ...	A	,, ..	J. Montgomery ..	Milawa
813	Futurist	A	Pony ..	E. Allan ..	Ondit

(To be continued.)

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

If the work has not already been done, the orchard should be kept in constant cultivation so as to conserve the abundant spring rains. Should the summer become hot and dry, this will be a very necessary precaution. Even where the soil had been previously well cultivated, the cultivators should again be run over the surface, as any hot weather will cause the soil to crust, which would be the means of dissipating a very considerable amount of soil water. Every effort should be taken to retain this moisture so that the fruit crops shall have all they require for their perfection. To further attain this end no weeds should be allowed to grow in orchard soils

Budding.

Young trees, or old trees that have been previously cut down in preparation for budding, may be worked towards the end of the month. It is advisable to select dull, cool weather for this operation, so that the sap may run more freely, and that atmospheric conditions may not have too drying an effect on the bud. The operation of budding is a very simple one, and is easily performed. To gain a successful end, the sap should be flowing freely, so that when the cuts are made the bark should "lift" or "run" easily, and without any clinging or tearing of the fibres, and it should separate freely from the wood. The bud selected should be firm and well matured, and should show no signs of premature growth whatever. It should be cut from the scion with a shallow cut, and if any wood be left in the cutting it should be taken out of the bud. A smooth, clean spot should be selected on the bark of the stock, and a T-shaped cut made, the vertical cut being longer than the horizontal one. The bark at the point where the cuts meet should be raised, and the bud inserted between the bark and the wood of the stock. The bud should be gently pressed down into position, and then bound with soft twine, string, or raffia. If the bud be too long for the cut, the top may be cut off level by means of a horizontal cut. With practice it will soon become possible to take the buds so that they will need neither cutting nor trimming.

After two or three weeks the buds should be examined to see if they have "taken"—that is, if the bud has united thoroughly to the stock. When this occurs, the tie may be cut. If a growth be desired at once all wood above the bud may be cut off some short distance above the bud, so as to prevent any bark splitting, and consequent loss of the bud, and so as to throw the bud out at a fair angle. Ultimately this should be properly trimmed.

If desired, the bud may be left dormant throughout the autumn and winter till spring. In this case the branch should not be cut off, but left on till the usual winter pruning.

SUMMER PRUNING.

The profuse spring rains have caused a vigorous growth in the fruit trees. In order to more economically utilize this abundant growth, it should be now summer pruned, particularly on the apple and pear trees. Care should be observed that as much of the leafage as possible is retained on the tree. Unduly long laterals of fruiting trees may be shortened back, always cutting to a leaf. Unnecessary terminal leader growths, of which there are sometimes three or four, all strong growing, may be reduced to one, retaining this one as a leader. In no case should this growth be cut or interfered with in any way.

The results of these cuts will be to divert the sap which was flowing into growths that would subsequently be pruned, into more profitable channels, so that weak buds and growths may be strengthened, and induced into fruit bearing.

The Vegetable Garden.

The work in this section is much the same as in the flower garden. Good mulching and regular soil stirring will be the work for the month. As soon as any bed is cleared of vegetables it should be manured and well dug over in preparation for the next crop. Deep digging is always desirable in vegetable growing. If any pest, such as aphis, pea mite caterpillars, or tomato weevil, have been present, it would be advisable to burn all the crop refuse, or to destroy any insects that remain, and to give the plot a dressing of gypsum, or of Clift's manurial insecticide.

Keep the tomatoes well watered and manured, pinching out surplus and strong grown laterals. In early districts the onion crop will be ripening. In late districts, or with late crops, the ripening may be hastened by breaking down the top. An autumn crop of potatoes may be planted. Cabbage, cauliflower, lettuce, and celery plants may be planted out. Keep asparagus and rhubarb beds well watered.

The Flower Garden.

January should be a busy month in the garden. It may be necessary to water frequently, and after every watering the surface should be well loosened, and stirred with the hoe to keep it moist and cool. More cultivation and less water is a good rule to be observed. The hoe should be used more, and the hose less, in summer; greater benefits will accrue, and the water bill will be considerably reduced. Mulchings with straw, grass, &c., are very useful just now. The mowings from lawns form valuable mulching. Waste tobacco stems are also valuable as a mulch.

Dahlias, chrysanthemums, gladioli and other tall-growing, slender herbaceous plants will require support in the way of stakes. They will also need mulching considerably. These plants should receive no check whatever, and should be continued with a regular even growth right through the season. Another desideratum is that soils should be well drained, as plants of all descriptions thrive better in well-drained soils.

A sharp look-out should be kept on these plants for attacks of red spider. If this insect appears, a good spraying of tobacco solution or benzole emulsion should be given.

Constant watch will need to be kept for the various small caterpillars that attack the buds of these plants. Spraying with a weak solution of paris green and lime, or similar insecticide, will be useful. Hand-picking should also be resorted to.

REMINDERS FOR FEBRUARY.

LIVE STOCK.

HORSES: *At grass.*—Supplement dry grass, if possible, with some greenstuff. Provide plenty of pure water and shade shelter. *In stable.*—Supplement hard feed with some greenstuff, carrots, or the like, and give a bran mash once a week at least. Avoid over-stimulating foods, such as maize and barley. Give hard feed in quantities only consistent with work to be performed. Stable should be well ventilated. and kept clean. When at work, give water at short intervals. Always water before feeding. Great benefit will result in supplying horses—more especially young ones running at grass—with a lick. The following one is recommended:—

Salt	20 parts
Lime	20 parts
Superphosphate	10 parts
Sulphate of iron	5 parts.

By having troughs constructed that will protect the lick from rain a considerable saving will be made.

Horses at grass require their feet attended to at frequent intervals, otherwise deformity of feet and lameness may result.

CATTLE.—Provide succulent feed and plenty of clean water easy of access; also shade and salt lick in trough. Have each cow's milk weighed and tested for butter fat regularly. Rear heifer calves from those that show profitable results. Give milk at blood heat to calves. Keep utensils clean or diarrhœa will result. Do not give too much at a meal for the same reason. Give half-a-cup of limewater per calf per day in the milk. Let them have a good grass run or lucerne, or half-a-pound of crushed oats in a trough. Dehorn all dairy calves except those required for stud or show purposes. Keep bulls away from cows. Write for Bulletin 52.

PIGS.—Sows about to farrow should be supplied with short bedding in well-ventilated styes. All pigs should be provided with shade and water to wallow in. There will be plenty of cheap feed available now, and there is a good margin between cost of feed and price for fat pigs. Read *Bulletin* No. 16.

SHEEP.—Ewes with a predominance of British blood do not come regularly into season until the present month. This is particularly the case in Gippsland and South-Western Victoria, if these strong-woolled ewes were bred in the cool wet districts. Most of the pure-bred ewes of British origin very seldom take the ram until February, March, or even as late as April, with the possible exception of studs bred in the north, or recently imported.

Lambs dropped in July, August and September, may suit certain districts in the south, but early lambs are most profitable in normal years north of the Divide. To breed out this late-lambing tendency, and to procure quality and quantity of wool as well as a good framed sheep, use well-bred and well-woolled large-framed Merino rams on all strong-woolled cross-bred ewes. If the right type of Merino ram is not obtainable at reasonable rates, secure good Corriedales or Comebacks. Narrow hard-looking rams are usually active workers, and in a flock of ewes with other rams, they often get the greatest number of lambs. If any such rams are of necessity to be used, keep them back for a few weeks, and join later with the flock after the best of the rams have been running with the ewes for at least three weeks.

The second dipping of sheep affected with tick or louse can be undertaken this month. A good water supply is vital. Provision should be made for prevention against fire and losses by disease or drought.

POULTRY.—Chickens should now be trained to perch; they will be more healthy.

Provide plenty of green feed and give less grain and meat. Avoid condiments. Keep water in cool shady spot and renew three times each day. Keep dust bath damp.

CULTIVATION.

FARM.—See that haystacks are weatherproof. Summer fallow and prepare land for winter fodder crops. Get tobacco sheds ready for crop. In districts where February rains are good, sow rye, barley, vetches, and oats for early winter feed.

ORCHARD.—Spray for codlin moth. Search out and destroy all larvæ. Cultivate the surface where necessary and irrigate where necessary, paying particular attention to young trees. Fumigate evergreen trees for scale. Continue budding.

FLOWER GARDEN.—Cultivate the surface and water thoroughly during hot weather. Summer-prune roses by thinning out the weak wood and cutting back lightly the strong shoots. Thin out and disbud dahlias and chrysanthemums. Layer carnations. Plant a few bulbs for early blooms. Sow seeds of perennial and hardy annual plants.

VEGETABLE GARDEN.—Continue to plant out seedlings from the seed-beds. Sow seeds of cabbage, lettuce, cauliflower, peas, turnips, and French beans. Keep all vacant plots well dug.

VINEYARD.—February is the best month for the "yema," or summer bud graft (see *Bulletin* No. 35, available on application). Select and mark the best-bearing vines of varieties from which scions will be required for next spring's grafting.

Given suitable climatic conditions, downy mildew will make its appearance. If vines were not sprayed in January they should be sprayed this month. The final spray (January or February) is most important for the protection of the foliage, thus insuring the ripening of the fruit and well-nourished wood, without which a good crop cannot be expected next year. Sulphur again, if oidium is prevalent, but avoid sulphuring wine grapes too short a time before gathering. The sulphur may be mixed with Bordeaux mixture, thus enabling the two diseases, oidium and downy mildew, to be combated simultaneously.

Cellars.—Prepare all plant and casks for the coming vintage. An ounce of bisulphite of potash, or a couple of fluid ounces of bisulphite of soda solution, to each bucket of water used to swell press platforms, tubs, &c., will help to keep it sweet. Keep cellars as cool as possible. Complete all manipulations so as to avoid handling older wines during vintage.

In the case of very hot weather occurring during vintage, attention is directed to the new wine-making method by "Preliminary Maceration," described in a pamphlet obtainable on application.

RAPE The Food for Sheep

SOW NOW FOR QUICK GREEN FEED

RAPE is a profitable Winter crop, and is valuable for pasturing sheep during the Winter months.

A Great Fattening Food for Horses, Cows, Sheep, Pigs, &c.

Sow now, it will catch the Autumn rains, and will be ready for pasturing in about 10 weeks. A crop is thus available for stocking before the Winter sets in.

Somner's "Tip-Top" Giant Kangaroo Rape

A sturdy and rapid grower; it has a strong tap-root, enabling it to stand long periods of drought. Stalks break easily, and are very succulent right through. **Will not taint the milk.** Sow 4 to 6 lbs. per acre in drills; 8 to 12 lbs. broadcast. **Will fatten 3 more sheep per acre than any other kind.**

Dwarf Essex **Imported English (true). Dutch. New Zealand.** (From imported English Seed.) Finest quality. Grown from pure stock.

White Mustard

Prevents Blowing in Sheep. 1 lb. per acre with Rape.

Egyptian or Berseem Clover

"Misskawi" Brand (imported direct), specially re-machine cleaned

A Great Winter Fodder

Recommended as an annual Winter Clover for warm countries where irrigation is practised. Valuable for its green or dried fodder, and as a winter soiling crop for orchards, vineyards, &c., on irrigated land. A strong-growing annual, with succulent, fleshy stems and broad, soft leaves. The flowers are cream or pale yellow in colour, and are clustered together in a compact, cylindrical spike.

The first cut is available from 45 to 60 days after sowing, followed by a second and third cut, and sometimes a fourth, although the latter is never heavy, and is usually reserved for seed. All kinds of stock eat it readily, and it may be given to them at any stage of growth; it does not taint milk in the slightest degree. This Clover will re-seed itself in a pasture on good land, and thus becomes practically permanent.

Fallow must be thoroughly clean prior to seeding. Sow through the drill, but care should be taken to see that the points of the drill are kept just on the surface of the ground.

Graze lightly, or cut when plants are a few inches high. They will then stool out well. **Sow 8 to 12 lbs. per acre in drills, or 20 to 30 lbs. broadcast.**

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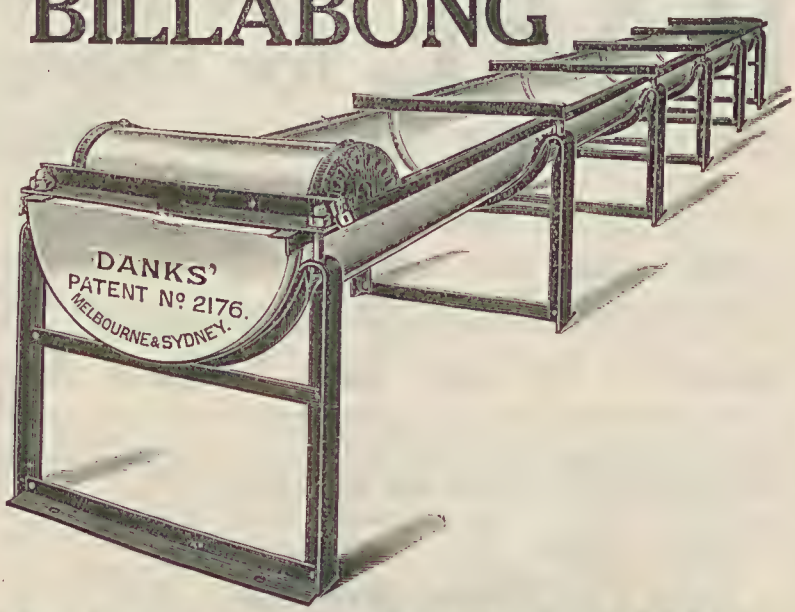

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FARMERS and GRAZIERS

The application of a heavier dressing of Superphosphate will produce

MORE WHEAT.

The top-dressing of your pasture means

MORE WOOL,

MORE MILK, and HEALTHIER STOCK.

ADDRESS YOUR INQUIRIES TO—

WISCHER & CO. PTY. LTD.

Manufacturers of Superphosphate, and Special Fertilizers for all Crops.

OFFICES:
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Farmers! —— Use

"ANTI-BUNT"

(Copper Carbonate)

A preventive against Bunt or Smut in Wheat and Oats.

ANTI-BUNT is manufactured in powdered form and is preferable to dipping, for the following reasons:—

1. It saves time and labour.
2. The seed can be treated any time before planting, and it is not necessary to use great care in disinfecting seed containers.
3. The seed does not become wet, so there is no danger of the seed heating or sprouting if it is necessary to keep it for some time after treating. The drill does not have to be set for swollen grain.
4. Anti-Bunt does not injure the seed as liquid preparations often do.
5. Anti-Bunt has a tendency to stimulate seed germinations, and thus increases yield.

For further particulars write to:—

A. VICTOR LEGGO & CO.

MELBOURNE: 497 Collins Street.
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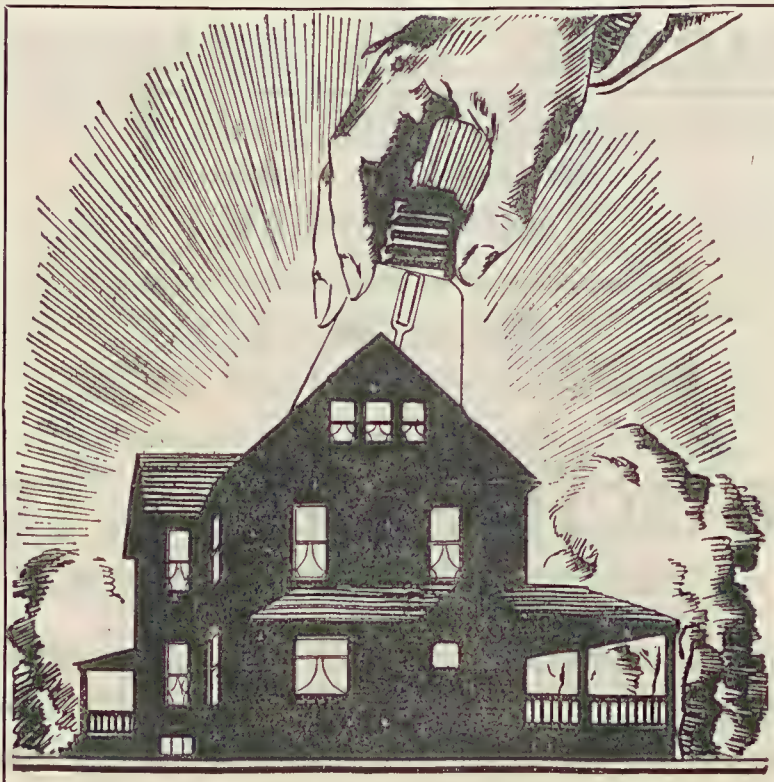
Manufacturers of "Vallo" Brand Arsenical preparations, and other chemicals.

AGENTS THROUGHOUT AUSTRALIA.



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DELCO-LIGHT

The famous DELCO-LIGHT is the result of the long experience and the countless experiments of a vast organization which pledged itself to make an ideal electric plant for the country home.

In its reliability, in its compactness, in its economy of operation it is beyond comparison.

So simple and safe that a child can operate and take care of it, so perfect in its mechanical design that it practically never gets out of order and requires very little attention, it is undeniably the finest plant for your home.

Investigate DELCO-LIGHT—resolve this New Year to have all the comfort and convenience, the brilliant light, the power for household and farm appliances that electricity alone can give.

Call in and see us or write for Catalogue J.A. and Particulars

Delco-Light is made in 27 different sized plants

Warburton Franki
(Melb.) Limited
380-382 Bourke St., Melbourne (opp. Danks)
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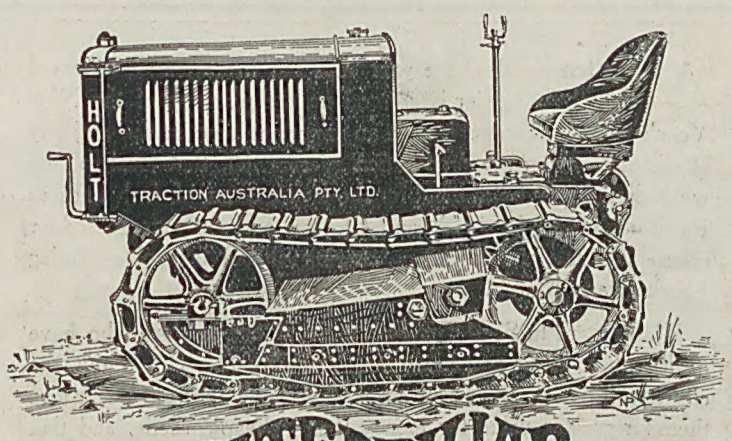
Caterpillar Traction Reigns Supreme

In all classes of Agricultural work, the HOLT Caterpillar Tractor fulfils the most exacting demands of the farmer. Ever ready, never tiring, and always on the job, doing its work thoroughly and at small running cost.



HOLT CATERPILLAR HOLT

AT HARVEST TIME

the Holt "Caterpillar" Tractor is particularly serviceable—stripping the crop in a minimum of time and expenditure, thus assuring their owner against bad weather and other losses, and with its Powerful Pulley it will operate the Thresher and thus save time, labour, and money. Between seasons the Caterpillar need never be idle, for there is feed to grind, wood to saw, tanks to clean, water to pump, and many other uses particularly adaptable to this Crawler Type Tractor.

HOLTS BUILD THE CATERPILLAR
and they have been building them since 1883.

Write for details and full particulars to—

TRACTION AUSTRALIA PTY. LTD.

469 Flinders Street, Melbourne———383 Sussex Street, Sydney

YATES RELIABLE SEEDS

FOR 1925

AS the last month of the year slips by, the attention of every thoughtful farmer is centred on the planning of the New Year's work. Autumn is such an important time in the majority of districts, and early preparation so essential, that much of the work should now be in hand for the laying down of such lines as Pasture Grasses, Lucerne, and Clovers, and early green fodder crops like Oats and Barley. Sowing should take place during February and March.

With regard to Seed Supplies, those of our readers who have dealt with us in the past know that Yates Reliable Seeds give the cleanest, heaviest, and surest crops, they know that our Seeds give them far greater value for money than "cheap" seeds, and that the slight extra cost of Yates Recleaned and Tested Farm Seeds is more than repaid by the undoubted superiority of quality, growth, and strain. For 1925 we shall exercise the same scrupulous care in the selection, testing, and recleaning of Yates Reliable Seeds that has made them the choice of the leading agriculturists all over the Commonwealth.

We thank all our customers for their support this past season, and we wish them the Compliments of the Season and a bright and prosperous New Year 1925.

ARTHUR YATES & CO. Ltd.

Australia's Leading Seed House

SUSSEX STREET, SYDNEY, N.S.W.

Letters G.P.O. Box 2707. —— Wires—"Seedsman, Sydney."

By Authority: H. J. GREEN, Government Printer, Melbourne.

DEPARTMENT OF AGRICULTURE, VICTORIA

Red Poll Dairy Herd

The Department has now completed the orders for calves that were booked ahead of calving when the advertisement was withdrawn; consequently the booking of orders for bull calves from the forthcoming calvings has now been resumed.

BULL CALVES are sold for delivery at a month old at prices based approximately on the actual milk and butter fat record of the dam at the rate of 1s. per lb. of butter *fat* yielded. Thus a calf from a cow with a 400 lbs. butter fat record is sold for 20 guineas, one from a 300 lb. butter fat cow for 15 guineas, and so on. Bull Calves ex heifers on their first calf are sold for a set price of 10 guineas.

(For Record of Yields of dams see Red Poll Herd Book.)

The Bulls in Use include—

VICE REGAL (95 A.A.)

Sire: Nicotine (69 A.A.). Dam: Velveteen (Imp.) 22875 (2 A.A.).

VICTORIA VOLCANO (322 A.)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).

Dam: Tonga (253 A.) by Honingham Archbishop (imp.) 9702 (48 A.A.).

Tonga's butter fat yields for 6 successive lactation periods are as follow:—1916, 341 lbs.; 1917, 398 lbs.; 1918, 419 lbs.; 1919, 479 lbs.; 1920, 428 lbs.; 1921, 562 lbs.

BELLIGERENT (Imported) 11096 (8 A.A.)

	Dam's Record (1st milking) 7144 lbs. milk.							
Dam's Dam's	,,	14533 lbs. milk	...	4	years	average	12871 lbs. milk.	
Sire's Dam's	,,	10370	,,	... 7	,,	,,	9354	,,
Sire's D. Dam's	,,	9510	,,	... 12	,,	,,	8033	,,
G. Sire's D. Dam's	,,	10215	,,	... 7	,,	,,	9386	,,
G.G. Sire's D. Dam's	,,	12565	,,	... 10	,,	,,	8853	,,
G.G.G. Sire's D. Dam's	,,	10088	,,	... 2	,,	,,	9754	,,

Inspection of the Herd is Invited.

Visitors will be met at the Station on notifying the Manager, State Research Farm, Werribee.

Application for purchase to

Dr. S. S. CAMERON, DIRECTOR OF AGRICULTURE, MELBOURNE.

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